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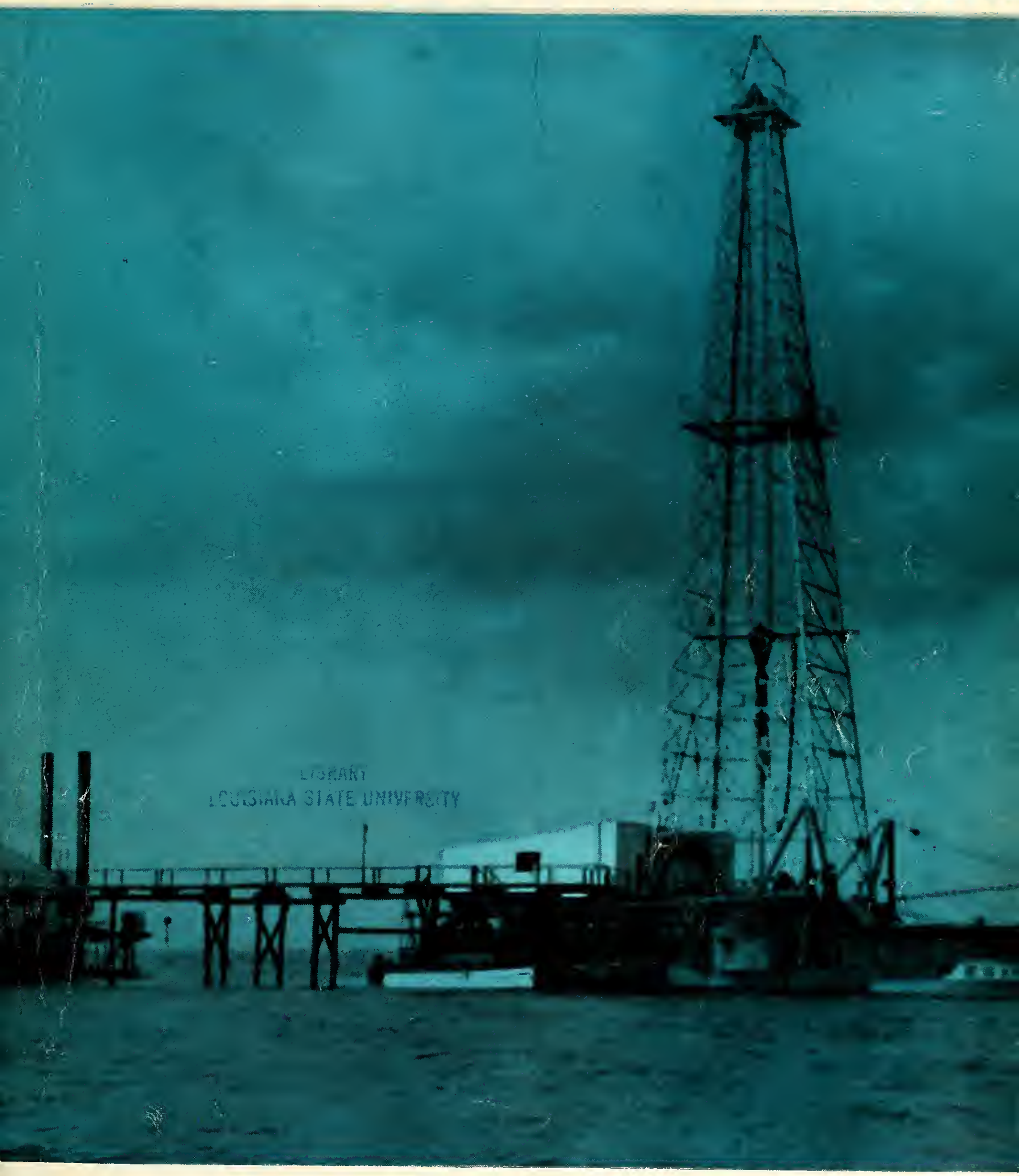
OUISIANA CONSERVATION REVIEW



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PARTMENT OF CONSERVATION, STATE OF LOUISIANA • SPRING, 1939

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IT SURE LOOKS LIKE FERDINAND . . . . .

. . . . . spending his vacation in Louisiana, basking in the balmy air of Springtime, with the whiff of wild flowers in his nostrils . . . . .

Forgotten are the insouciant moos of frolicsome cows, the thrill of the toreador song . . . . . here in this sylvan retreat there is nothing to disturb the tranquillity of his soul.

Nature is kind to Louisiana. There is no stint of her largess. Here the good rich earth has been impregnated with abundant rainfall and has yielded her bountiful harvest of beauty.

Here, too, Nature is often encountered in her virgin state, unmolested by the hand of man, in many secluded retreats, off the beaten paths—the priceless reward of questing eyes.

This temperamental bull may never know the meaning of conservation—and yet he is one of its most conspicuous beneficiaries.

Surely this is the garden spot of the world, thinks Ferdinand—right next door to the good bull's heaven.

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Gift
Publisher
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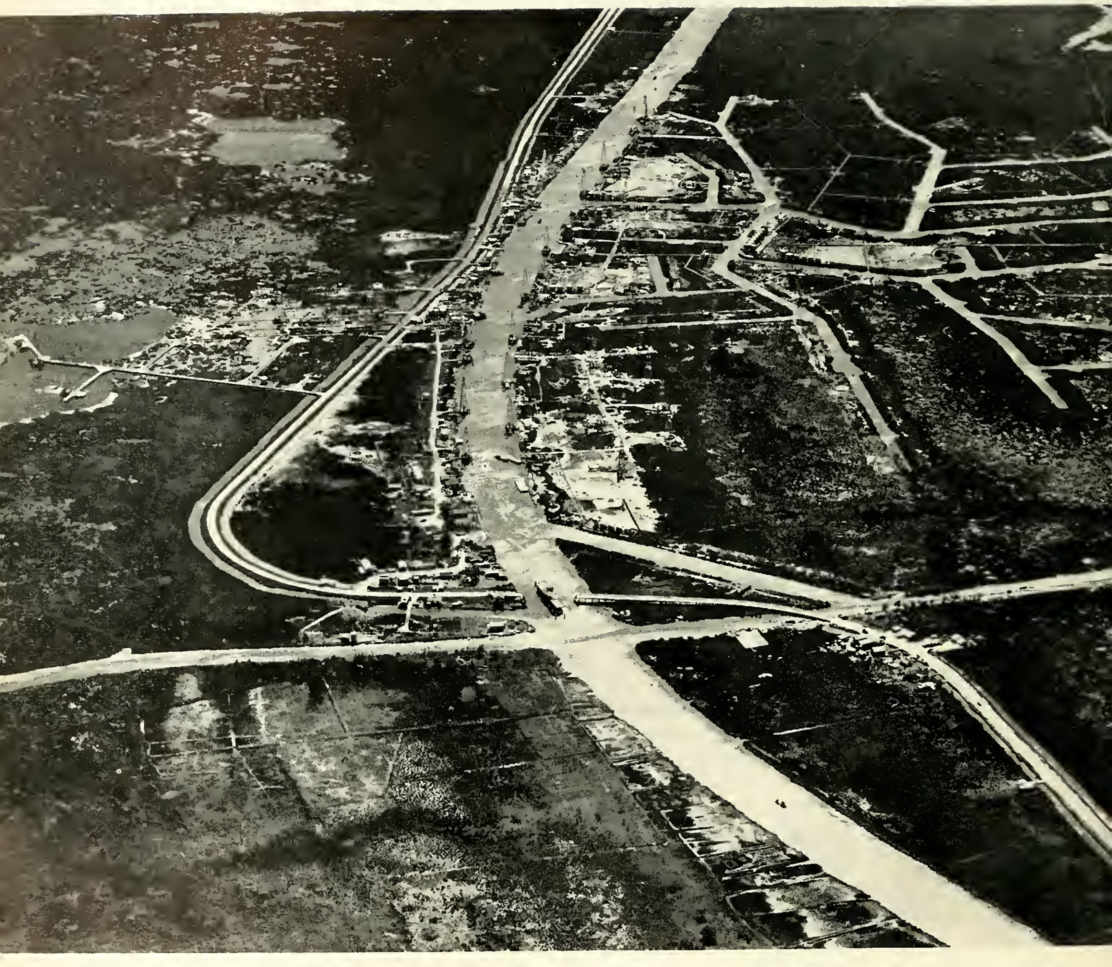


Davis Aerial Photographic Service, Houma, La.

■ The Leeville field, about 50 miles southwest of New Orleans, in Lafourche Parish, Louisiana. This field is traversed by the Bayou Lafourche, lined on both sides with producing wells. 1938 production of crude oil, 1,813,379 barrels.

WELCOME

American Petroleum Institute

to the next capital of the oil world!

By
William G. Rankin
Commissioner
Department of Conservation

Drilling barge operation of The Texas Co., Lafitte field, Jefferson Parish, La., 22 miles south of New Orleans. There are 30 completed wells in this field, producing from the 10,000-foot level.

We are sometimes tempted to speculate on the future course of events, to consider the relation of cause and effect, to weigh the positive and negative factors of an equation—and attempt to interpret our analysis for the edification of others.

If I have succumbed to such a temptation it is because I am motivated by what is perhaps a natural ambition to impress this important gathering of the representatives of a great industry.

But when we venture to predict that New Orleans will some day be the oil capital of the world we do so with a sense of responsibility and a realization of the possible effect and influence of the implication.

Since the founding of New Orleans over 200 years ago there has been a feeling that we have here a city of destiny; that its location near the mouth of the Mississippi makes it the natural gateway of the richest valley of the world. Thomas Jefferson had a vision of its future greatness when he purchased Louisiana from Napoleon Bonaparte.

But the growth of great cities is influenced and controlled by many divergent factors. We have only to recall that in the decade 1840-1850 New Orleans was the fastest growing city of the United States, terminus of our River-borne commerce; but the tide of population that was swelling and pouring down the Valley in our direction was shunted westward by the War Between the States and the Reconstruction that followed—for forty years our clock of progress was practically at a standstill.

Houston and Tulsa will perhaps pardon the accompanying views of a native Orleanian. In any event the facts cited by Commissioner Rankin would seem to justify his civic pride and faith in the future of a great city.

NO MUSHROOM GROWTH

Because of these conditions New Orleans was a city of comparatively slow growth for several decades, its increment of wealth being derived from the rich plantations of this section; but it was built on solid foundations, not of mushroom variety, and apparently there was no diminution of the faith in its future.

I will direct your attention to some of the factors that will contribute to the fulfillment of the destiny of New Orleans as one of the great cities of the world.

It is axiomatic that no city is greater than its hinterland, that when we have an industrial population in Louisiana and Mississippi as dense as that of Illinois and California the population of our city will equal that of Los Angeles or Chicago. But it is not merely a question of the population that pays its tribute of trade to the metropolis—there are other factors that contribute to its welfare and prosperity.

Just as the tide of population was shunted westward the River-borne commerce was stifled by the east-and-west railroads, which conspired with other interests to move Middle West freight to New York instead of moving it by its natural route through the funnel of the Valley; but in more recent years New Orleans has demonstrated its natural advantages for both domestic and foreign business, so that it now ranks second in the United States as a two-way port, the volume of its imports giving assurance of frequent and dependable sailings.

■ **Discovery well, State of Louisiana P. P. No. 3, Timbalier Bay, Lafourche Parish. Gulf Oil Co., operator.**

Revival of river transportation will inevitably have its influence on freight rates and the favorable position of New Orleans as a seaport. We must also bear in mind that our consuming centers of population are now in the Middle West; that they are served by the Mississippi and its tributaries; that their natural gateway for both exports and imports is the Port of New Orleans.

INDUSTRY MOVES SOUTHWARD

Further, that the trend of industry is very definitely southward, away from the congested areas of the North and East. It is inevitable that this industrial development should encompass our Southern metropolis.

But I have in mind another factor that will change the current of our lives, remake the sky-line of New Orleans. That factor is the acceleration now taking place in the oil development of our State.

It may sound grandiose to say that the world's greatest petroleum reserve, per square mile, lies within the boundaries of our State. I am taking the word of our geologists for that. What I do know from my own personal observation is that the deeper drilling of our Gulf Coast region has extended the area of production farther and farther eastward, that we brought in twenty new oil fields in South Louisiana during the past year.

There is some significance in the fact that one of these fields, with thirty wells producing from the 10,000-foot level, is only twenty-two miles from the City of New Orleans—only twenty-two miles from the terminus of the greatest system of inland waterways in the world.

Fuellhart photo

■ **The Eola field in Avoyelles Parish, near Bunkie, La. One of the newest and most important developments in Louisiana. Production of oil from the Wilcox formation was predicted in a report issued by the Department of Conservation in 1936.**

Metzger photo

Sunset through the trees at Bayou Choctaw, Iberville Parish, Louisiana. Center, Crusaders' rig, E. B. Schwing No. 4.

This distribution depot offers water connections with the heart of the consuming area, that rich territory of the Middle West with its preponderance of population and buying power. Here within this depot and its environs the oil industry will find it advantageous to establish its refineries and plants for the manufacture of supplies.

During the past five or six years we have witnessed a fifty per cent increase in the consumption of gasoline and with the expansion of the automotive industry we may anticipate a continued increase in the rate of consumption. If we are to keep pace with the market demand there will be no need to curtail our rate of production; and if this production flows through natural channels its logical depot of distribution will be New Orleans.

The area of potential production is already extended east of the Mississippi, in southeast Louisiana and southern Mississippi; and with the intensive explorative effort now engaged we may expect in the near future an extension of the area that is tributary to New Orleans.

In stressing the natural advantages of New Orleans it is not my intention or desire to detract from the obvious merits of other oil centers, some of them located in Louisiana. As a matter of fact the industrial campaign which Governor Leche has prosecuted with characteristic vigor is now bearing fruit in all sections of the State. The ten-year tax exemption for new industries is an attractive feature of this campaign.

I believe all Louisiana joins with me in the hope that New Orleans will come into its own as the next capital of the oil world. While there may be occasional manifestations of a spirit of rivalry, which is only human, there is a community of interest between city and country. We are all quite proud of our historic old town—and we will surely be disappointed if oil is not the magic sesame that opens the door of its manifest destiny.

FACTS ABOUT THE PETROLEUM INDUSTRY OF LOUISIANA

(as of January 1, 1939)

CRUDE OIL

Number of fields	113	
Number of fields brought in during 1938	20	
Number of producing wells	4559	
Average daily production per well (in barrels)		256,762
Total production in 1938 (in barrels)		94,368,529

NATURAL GAS

Total production in 1938 (cu. ft.)		259,945,603,000

GASOLINE

Number of gasoline plants	24	
Number of fields where plants are located	12	
Gasoline extracted in 1938 (gallons)		2,319,048
Gas used in extraction (cu. ft.)		128,950,671,000

CARBON BLACK

Number of carbon black plants	8	
Number of fields where plants are located	2	
Carbon black extracted in 1938 (pounds)		39,485,509
Gas used in extraction (cu. ft.)		23,608,600,000

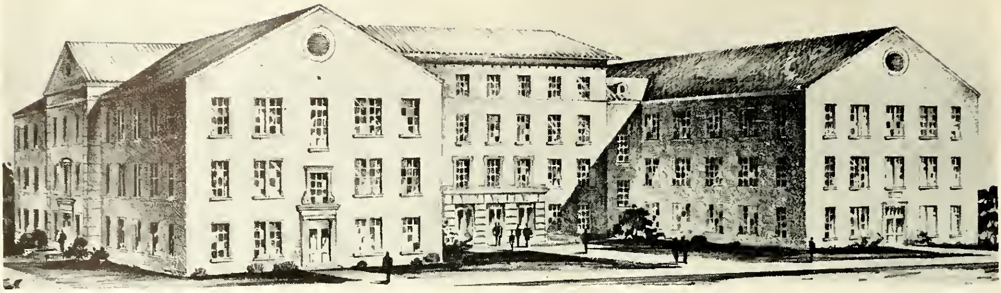
* * *

THE SHRIMP CATCH

The Louisiana shrimp catch for the year 1938 amounted to 76,368,000 pounds, according to J. B. Dauenhauer, Jr., director of the Division of Fisheries, Department of Conservation. The value of the catch to the commercial fishermen was $2,672,900.

* * *

Birds are born daylight savers. The students of their matutinal behaviour must therefore set his alarm clock early, literally rising before the lark.



Weiss, Dreyfous & Seiferth, Architects.

■ **Geology and Petroleum Engineering Buildings, Louisiana State University.**

Louisiana's New Plant For Geological Study and Research

Construction of the new building of the School of Geology of Louisiana State University, the Geological Survey and Research Division of the Department of Conservation, on the University grounds near Baton Rouge, has been under way for several months and now nears completion.

With the former geology building, which has been extensively remodelled to conform to the unified plan, the new building and the connecting structure, the State of Louisiana will possess one of the largest and most completely equipped plants for the pursuit of geological knowledge, for study and research, within the borders of the United States.

This magnificent plant was made possible by the appropriation of $350,000 by the General Assembly at its last session. The amount was supplemented by $100,000 for remodelling the old building and $100,000 for new equipment. When completed the three buildings will provide 90,000 feet of floor space and the total investment in plant and equipment will approach the million dollar mark.

With this new plant the School of Geology, Geological Survey and Research Division of the Department of Conservation will have the physical equipment to take care of their expanding activities in many important fields. For some years Dr. H. V. Howe and his associates have been building a department of Geology that now ranks with the foremost in America, and through the State Geological Survey they have contributed a service of inestimable value to the development of the petroleum industry in Louisiana.

Something of the character of this service may be inferred by a glance through the stacks in the attic of the former geology building, where 400,000 cores from over 3,000 wells are carefully labelled and stored for reference. The laboratory space for examining these samples now occupies a large section of the third floor of the old building and the additional space provided by the new construction will of course give more elbow room for the students engaged in this important adjunct of the scholastic courses.

The attic of the former geology building was especially designed to take care of a heavy load, as approximately 300 pounds of cores, fossils and rocks are received daily. At the present rate of increase these collections will completely fill the attic space of both old and new buildings in ten years—but that is anticipating trouble. It seems that Dr. Howe is "bugs" about these "bugs" or fossils—and he will always manage to take care of more fossils.

ENTER HERE

The main entrance to the unified plant will be through the central structure with which the old and new buildings are connected. Here at the main entrance there will be a public museum, a comprehensive display of geological specimens in which the public may be interested.

Adjoining the public museum there is a small auditorium, after the Greek ampitheatre style, with 380 seats. It is expected that this will attract scientific bodies or organizations engaged in geological and related work.

Turning to the right from the main entrance we enter the first floor of the old wing. The School's department of petroleum engineering occupies the entire ground floor as well as a section of the second floor of this wing, along with the natural gas laboratories.

It is interesting to note that this department's testing machines have saved the oil industry thousands of dollars, having determined by actual test the effect of pressure and heat on cement at the bottom of the well, so that less expensive products might be used when justified.

In about 3,600 square feet of the lower floor of the former building or old wing it is planned to install an exhibit of drilling and production equipment, supplies, etc, and the several components of the industry have indicated a desire to co-operate in making this a most interesting petroleum engineering museum.

A section of the second floor of the old wing is also devoted to the study of rocks, sediments, etc. Offices of the Geological Survey are at present located on this floor.

THE GEOLOGICAL LIBRARY

Dr. Howe and his associates are justly proud of their geological library, which is the most comprehensive in the South. The 10,000 volumes have been gradually assembled from all parts of the world, over a period of 17 years, since 1922, and its complete files of geological publications, many dating back over 100 years, include the reports of geological societies of London, Edinburg and most of the European nations.

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The School of Geology of the Louisiana State University and Louisiana Geological Survey

By

Cyril K. Moresi

State Geologist

Completion of the new geology and petroleum engineering buildings at Louisiana State University has focused the attention of the general public and those engaged in the development of the mineral resources of the Gulf Coast area on the splendid service that has been rendered the State of Louisiana by the Geology Department and the tremendous advance that has taken place, in both laboratory and field, under the instruction and guidance of the professors and graduates of this school.

One of those who for several years has recognized the importance of this work, particularly in its relation to the development of the oil industry in Louisiana, is the State Conservation Commissioner, William G. Rankin. Commissioner Rankin was greatly impressed with the needs of this rapidly expanding department for more adequate space and laboratory facilities when he was appointed Commissioner in 1937. With the endorsement and support of Governor Richard W. Leche, he was able to impress the members of the State Legislature with this need to the end that a large appropriation was made by the General Assembly at its last session for the purpose of erecting a new geology and petroleum engineering building.

DR. H. V. HOWE APPOINTED

The School of Geology of the Louisiana State University and the Division of Minerals of the Department of Conservation were organized at about the same time. The excessive waste of natural gas in the rapidly developing oil and gas field in North Louisiana in the early nineteen twenties was responsible for the Governor's action in thoroughly organizing a Division of Minerals in the Department of Conservation and providing adequate funds for the proper enforcement of its regulations. The Governor also realized the necessity of establishing a geology and petroleum engineering department at the Louisiana State University. Dr. Henry V. Howe was appointed professor of geology in 1922, and the University then embarked on a policy of developing a professional school of geology and petroleum engineering, so that Louisiana boys might have an opportunity to fit themselves for positions in the petroleum industry and also assist in the Department of Conservation's researches in the mineral industry.

The purpose of this article is to relate the activities of the School of Geology of Louisiana State University from the time of the origin of the present Louisiana Geological Survey of the Department of Conservation to the time of the occupation of the quarters in the new geology building. The history of the School of Geology of Louisiana State University from the year 1865 to the year 1934 was presented in an article entitled, "The Contribution of Louisiana State University to the Development of Louisiana Geology."[1] The activities of the State Department of Conservation in dealing with the development and conservation of the mineral resources of the State have been related in an article entitled, "Conservation of Louisiana's Mineral Resources, 1906-1935."[2]

■ **Petrographic microscope, symbol representing "Geology," over middle door of main entrance to the new Geology Building. On other doors, Paleontology is represented by an enlarged microfossil, Petroleum Engineering by a conventionalized oil field.**

SURVEY ORGANIZED

Some years passed before the University's geology school and the Department's mineral division had become so well organized, that it became necessary to create the present Louisiana Geological Survey, as a division of the Department of Conservation, to cooperate with the School of Geology in a united and definite program of developing and conserving Louisiana's mineral resources. Mayor Robert S. Maestri, who was then Commissioner of Conservation, and Director James P. Guillot of the Bureau of Research of the Department of Conservation realized the need for a definite cooperative program of mineral research and through their efforts the Louisiana Geological Survey was created by an Act of the Legislature in 1934. The provision of this Act set forth a definite cooperative program of geological and mineral research between the School of Geology and the Louisiana Geological Survey. Therefore, it is difficult to discuss the accomplishments of the Louisiana Geological Survey without reference to the University's geology school, for the reason that the two have developed in unison under the direction of Dr. Howe, who is Director of the School of Geology and also Director of the Geological Survey.

In this connection, it should be added that research of the Geological Survey is only one of the many important activities of the School of Geology. This school has trained graduates who are now engaged in geological work in many parts of the world. Some of these graduates who received the benefit of an association with Dr. Howe and his staff have obtained positions of responsibility in both domestic and foreign countries through the personal efforts of "Heinie," as he is affectionately known to many of his students and graduates.

The faculty of the School of Geology serve in conducting research activities either personally or in directing graduates. Neither the Director nor the faculty of the School of Geology receive any remuneration for their services to the Geological Survey—their spare time is dedicated to the services of the State. The employed research personnel of the

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[1] By Henry V. Howe and Cyril K. Moresi, Louisiana Conservation Review, April, 1933, Vol. III, No. 2, pages 23-33.

[2] By Cyril K. Moresi. Published in four installments in the Louisiana Conservation Review; July, 1933, page 26 ff.; October, 1933, page 21 ff.; October, 1934, page 3 ff.; and January, 1935, page 14 ff.

Geological Survey consists chiefly of graduate students who have already obtained their Master's Degree in geology and who are on a half-time basis while continuing their training at the University.

SEVENTEEN REPORTS

The Geological Survey has already published seventeen reports through this cooperative program. The contributions of the faculty of the School of Geology to this series of bulletins may be summarized as follows: Dr. Howe has written or contributed as co-author to nine of the first fourteen geological bulletins, which have been published to date. Dr. R. J. Russell, Professor of Physical Geography, has contributed to three of this number; Dr. F. B. Kniffen, Associate Professor of Geography, has contributed to two of these reports; Mr. B. C. Craft, Associate Professor of Petroleum Engineering, has contributed to one; Dr. J. H. McGuirt, Assistant Professor of Geology, has contributed to two reports.

The following reports have served as doctorial dissertations at Louisiana State University: Geology of Catahoula and Concordia Parishes, by Dr. W. D. Chawner; Origin of The Cap Rock of Louisiana Salt Domes, by Dr. Ralph E. Taylor; and Geology of Caldwell and Winn Parishes, by Mr. John Huner, Jr. The first and third of these reports were prepared under the direction of Dr. Howe, and the second under the direction of Dr. R. Dana Russell, Associate Professor of Mineralogy. Five of the first fifteen bulletins are strictly paleontological in content, describing the microscropic fossils in Eocene and Oligocene deposits encountered at the surface or in wells drilled for oil in Louisiana. Four of these are joint papers, in which Dr. Howe served as senior author, some graduate student as the junior author. Fifteen parishes of Louisiana are covered in seven of the fifteen bulletins published in this series. These parish reports cover nearly one-quarter of the State—this may be considered quite an achievement for any survey which has been in operation for less than ten years!

In addition to these parish bulletins, each of which attempts to present the best possible knowledge of the geology of that area in all aspects so far as known at the time of the publication of the report, a recent report, Geological Bulletin No. 12, presents a more generalized summary of several phases of the geology of a broader district in the western part of the Florida Parishes.

Two anthropological studies have been issued by the Geological Survey, both by Mr. James A. Ford, Research Associate in Anthropology, in the School of Geology. The anthropological studies are furnishing a sound basis for chronology of the pre-historic Indian life of Louisiana and serve as a very important factor in the geological research program in that they provide a means of dating recent geological changes. Intensive excavations are being undertaken at Marksville and at Cypress Bayou, and a research laboratory in New Orleans, all in cooperation with the Works Progress Administration, are rapidly extending the usefulness of anthropological research.

In summary: the bulletin series of the Louisiana Geological Survey now includes the following titles:

"Geology of Iberia Parish"—Geological Bulletin No. 1, 1931, 187 pp., 15 maps, 3 photographs.

"Foraminifera of the Jackson Eocene at Danville Landing on the Ouachita"—Geological Bulletin No. 2, 1932, 118 pp., 2 maps, 15 plates.

"Geology of Lafayette and St. Martin Parishes"—Geological Bulletin No. 3, 1933, 238 pp., 22 maps, 31 photographs, 2 plates.

■ "Marksville Pot" representing anthropology on the east door of the main entrance. This was designed originally by the oldest known inhabitants of Louisiana and was found near Marksville. Geography is represented by a map of the world according to Herodotus.

"Louisiana Sabine (Wilcox) Eocene Ostracoda"—Geological Bulletin No. 4, 1934, 65 pp., 1 map, 4 plates.

"Louisiana Jackson Eocene Ostracoda"—Geological Bulletin No. 5, 1935, 66 pp., 6 plates.

"Reports on the Geology of Cameron and Vermilion Parishes"—Geological Bulletin No. 6, 1935, 225 pp., 34 maps and illustrations.

"Louisiana Vicksburg Oligocene Ostracoda"—Geological Bulletin No. 7, 1936, 96 pp., 6 plates.

"Lower Mississippi River Delta; Reports on the Geology of Plaquemines and St. Bernard Parishes"—Geological Bulletin No. 8, 1936, 454 pp., 53 maps and illustrations.

"Geology of Catahoula and Concordia Parishes"—Geological Bulletin No. 9, 1936, 232 pp., 34 maps and illustrations, colored geologic map.

"Geology of Grant and La Salle Parishes"—Geological Bulletin No. 10, 1938, 246 pp., 50 maps and illustrations, colored geologic maps.

"Origin of The Cap Rock of Louisiana Salt Domes"—Geological Bulletin No. 11, 1938, 191 pp., 4 figures, 27 plates.

"Contributions to the Pleistocene History of the Florida Parishes of Louisiana"—Geological Bulletin No. 12, 1938, 158 pp., 8 figures, 15 plates.

"Reports on the Geology of Iberville and Ascension Parishes"—Geological Bulletin No. 13, 1938, 223 pp., 25 illustrations.

"Louisiana Cook Mountain Eocene Foraminifera"—Geological Bulletin No. 14, 1939, 122 pp., 16 illustrations.

"Reports on the Geology of Winn and Caldwell Parishes"—Geological Bulletin No. 15, 1939, in press.

"Louisiana Petroleum Stratigraphy"—Bulletin No. 27, 1936, 46 pp., 9 illustrations.

"Ceramic Decoration Sequence at an Old Indian Village Site Sicily Island, Louisiana"—Anthropological Study No. 1, 1935, 41 pp., 17 illustrations.

"Analysis of Indian Village Site Collections from Louisiana and Mississippi"—Anthropological Study No. 2, 1936, 285 pp., 50 illustrations and maps.

2871 PAGES

Thus since Geological Bulletin No. 1, issued by Howe and Moresi in 1931, the total number of pages in the bulletins is 2871. Geological Bulletin No. 1 was issued in 2500 copies. Increasing demand for the bulletins soon exhausted the available supply of Geological Bulletins Nos. 1 to 3, so that Geological Bulletins Nos. 4 to 7 were issued in 3500 copies and the initial imprint of all recent bulletins has been 5000 copies.

Preparation of the typical bulletins covering one or two parishes requires two or three Summers of field work. The geologist in charge ordinarily has from one to three field assistants and long days are spent identifying the various geologic and topographic units to be mapped. Oil and water wells are visited, detailed observations are made at all places of economic interest, such as possible oil or gas structures or mineral, gravel, sand and clay deposits. For every hour spent in field work, however, three or four hours must be spent in office work at the University. Here is the collection of reference books and maps, samples and logs from wells, comparative collections of fossils, mineral and chemical laboratories, drafting equipment, secretarial service and other requisites for geological research.

The Library of the School of Geology is the finest in the South. A graduate librarian, Mr. J. M. Goudeau, is in

[Turn to Page 53]

■ **General view of Jennings field about 1904, showing burning well and large number of derricks.**

Louisiana's First Oil Field

By

E. J. Hagstette, Jr.*

The Jennings Oil Field was discovered in the year 1901, with the completion of a well drilled by the Heywood Bros. and the Jennings Oil Company. It was not until after 1926 that this structure was definitely proven to be a salt dome. Since that time, it has been found to be of the piercement type with super cap and flank production. It is commonly referred to as the Evangeline dome, because of its proximity to the small settlement of the same name. The field is approximately seven miles northeast of the town of Jennings and approximately thirty-six miles east of Lake Charles in Township 9 South, Range 2 West, Acadia Parish, Louisiana.

EARLY DEVELOPMENT

Gas seepage and other surface indications showing possible presence of oil were long noted near the town of Jennings, by residents of Acadia Parish. However, it was not until the early part of 1901 that several business men of Jennings decided to make an attempt to test this land. On the strength of the surface indications, 2500 acres of land were leased. It was at this time that the old Spindletop Field, near Beaumont, Texas, was booming. No other production had as yet been obtained on the Gulf Coast and for that reason it was the center of the oil activity. It was, therefore, logical for these gentlemen to seek someone at Beaumont to develop their lease.

Mr. Scott Heywood, a young man of twenty-nine years of age, had been very successful over there and was highly thought of in the young industry. He was induced to visit Jennings and inspect the site of the present field. On his first trip, Mr. Heywood became so interested that he closed a contract to drill two 1000-foot wells for an undivided one-half interest in acreage, providing he could organize a company to be called The Jennings Oil Company. This was done and a location was selected on the old Clement tract. It is interesting to know that the landowner locked and barred his gates when he found that it was planned to drill "holes" on his property. He objected on the basis that his cattle would constantly be falling into these "holes" and breaking their legs.

All machinery for drilling the well had to be shipped from Beaumont and hauled over ungraded roads by mule teams. After all these difficulties, the well was finally spudded in. When the well reached a depth of 1000 feet, no show of oil had been encountered. This made the chance for obtaining production seem negligible, because oil at Spindletop came from around 1000 feet and the only other field in Texas (Corsicana) obtained production from about the same depth. After much discussion, the Heywood Brothers decided that it would be of no use to drill a second well to 1000 feet, because they knew the same formations would be encountered as in the first well. They, therefore, proposed to the Jennings Oil Company that they allow the second well,

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* Engineer, Department of Conservation.

■ **Xmas tree of discovery well, southwest flank of Jennings field, 1936.**

which was specified in the contract, to be drilled from the bottom of the first, making a deep test of two thousand feet.

This was a radical proposal in those days and can be compared to drilling a fourteen or fifteen thousand foot well in 1939. The Jennings Oil Company agreed and the drilling was resumed. Another decision had to be made when the well was at 1500 feet. All the drill pipe on the location had been used and to go deeper required ordering more. After more discussion, the extra drill pipe was ordered and the last four feet of the new pipe put the well into the "pay sand." According to stories, accredited to Mr. Heywood, this well was completed on September 21, 1901, flowing oil and sand. Several acres of rice were ruined because of the "gusher." Other accounts state that the well was completed in a Pliocene formation at a depth of 1882 feet in August, 1901. This formation, according to these other reports, was a loose sand that contained enough gas and oil to cause a blowout, which finally caused the abandonment of the well.

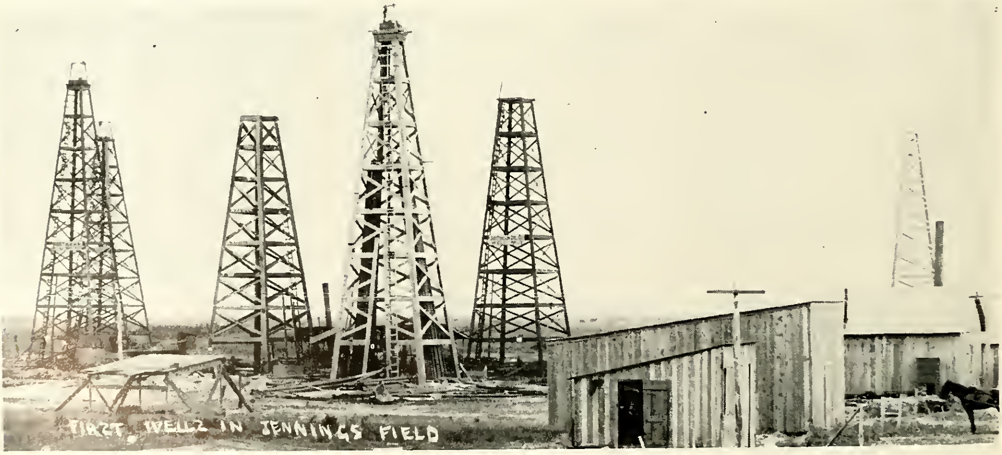
At any event, this completion was the signal for one of the most unique developments of any field that is still producing. Rapid development followed when the No. 2 well was brought in. This well "came in" making 7000 barrels of oil per day. While the flow of this well was not restricted in any way, as in modern producers, it can be seen that these wells producing from above the cap-rock, were extremely prolific. This particular well was later struck by lightning and burned for approximately one week before it was killed. This must have been an exciting time, because there was no special equipment to kill the well. Only one boiler was available and extra pumps and connections had to be sent from Texas. This fire was finally extinguished at a cost of about $20,000.00.

From 1902 through 1906 the field was subject to the most extensive drilling program in its history. A view of the field showed a forest of derricks nestled so closely together that one could step from the floor of one derrick to that of another. The Heywood Bros. built a pipe line, storage tanks and loading racks that were later bought by the Gulf Refining Company and used for many years. Oil was being shipped from the field as fast as it could be sold for thirteen cents per barrel. Production increased so rapidly that it soon passed a rate of 100,000 barrels per day. When this occurred, the transportation facilities were inadequate to handle such vast amounts. The demand began to decrease, but the mad boom of more and more drilling continued until, at one time, there was such a shortage of storage space that more than 7,000,000 barrels of oil were in open pits all over the field.

Wells were drilled in all directions from the first producer which was later found to be on the western edge of the central portion of the dome. In the year 1906, the production from super cap-rock formations reached a total of 9,025,000 barrels, which was the peak production for the field. About 50,000,000 barrels of oil were produced from 400 acres and most of this production came from 200 acres. One well that was called the "Wilkins" well, on the "Valle arpent" produced over 3,000,000 barrels of oil. This ended the most colorful period in the history of the field.

FIRST FLANK PRODUCTION

From 1901 until 1929, all production had been from shallow sands on top of the dome. The Yount-Lee Oil Company obtained leases in 1928 for the purpose of exploring the flanks in the search of



■ **Pioneer wells of Jennings field, about 1902.**

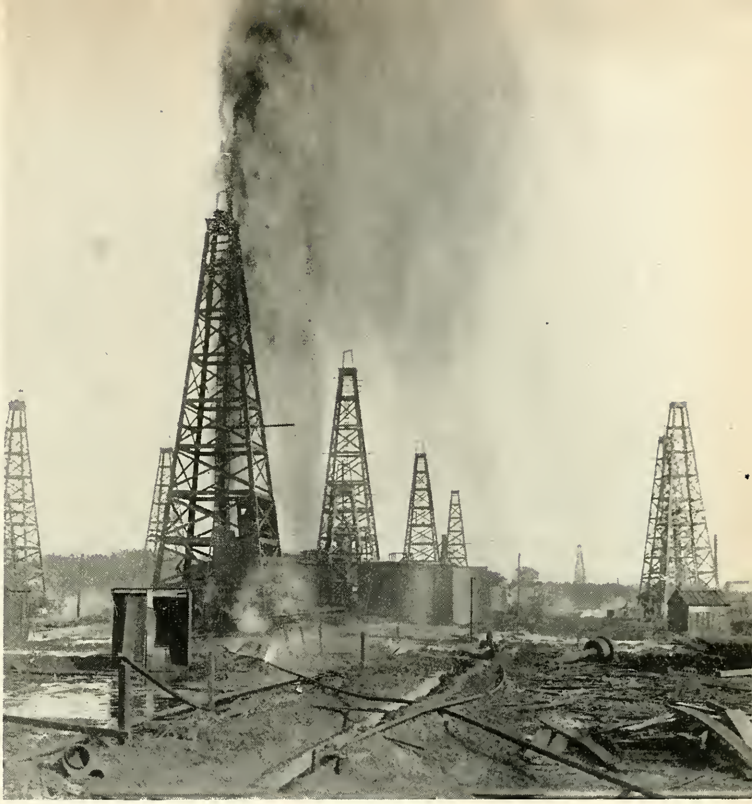
deep production. The development of the east flank was started in June, 1929, with the completion of that company's well, Houssiere-Latrielle No. 6. This well, and others later drilled by Yount-Lee Oil Co. (now Stanolind Oil & Gas Co.), definitely defined the east flank of the field. However, no success was experienced by this company in attempting to produce from the north and northeast flanks. At the date of this writing, there are no producing wells in this area. There is, however, some production on the northwest flank.

INTENSIVE FLANK DEVELOPMENT

When all the producing acreage was drilled on the eastern flank, there was a lull in activity until the Shell Petroleum Company's well, Conover Community No. 1, was drilled. This well was completed on the southeastern flank in 1936 and was the forerunner of the intensive flank drilling that characterizes the third stage of this remarkable field's development. Shortly after the completion of Conover Community No. 1, the Superior Oil Company began operations on the southwest flank. Their first well, William Leckelt No. 1, was completed in September, 1936. This portion of the dome has shown the greatest capacity for deep production. There are four main producing sand sections, varying in depth, according to the position of the well from the dome, from 6300 to 8200 feet. This rapid development of the flank area can be shown by a comparison of the six flowing wells and five pumpers during December, 1936, to the seventy odd flowing wells now producing.

There are yet possibilities for extension of this field. Early in 1938, the Superior Oil Company completed a well on the northwest flank in a new sand, and only recently this company extended the production of this sand around to the southwest flank. Another operator is drilling a well, which if successfully completed, will extend the producing area of the field approximately 1500 feet to the south. With the recent success of the Shell Petroleum Company in the southeast portion of the field, production has been obtained from nearly the entire periphery of the dome. The north to northeast flank has been barren to date. Stanolind Oil & Gas Company drilled two dry wells in this area during the past year. However, judging from the history of the other flanks, one cannot arbitrarily state that it will never produce.

Like many other oil fields, Jennings is not an attractive sight to the average person. But to those who are interested in seeing the advances made in the petroleum industry since the turn of the century, it offers an excellent study. The old shallow field is still producing, but wells which formerly "gushed" over derrick tops must now be pumped. Many wells have been producing here for twenty to twenty-five years. Small wooden derricks and antiquated equipment characterize this "stripper production area." The comparison of modern engineering methods to old operating practices is shown perfectly by means of the heavy, modern, drilling and operating equipment surrounding the central area of closely spaced wells.



■ Typical gusher in early days of Jennings field, about 1903.

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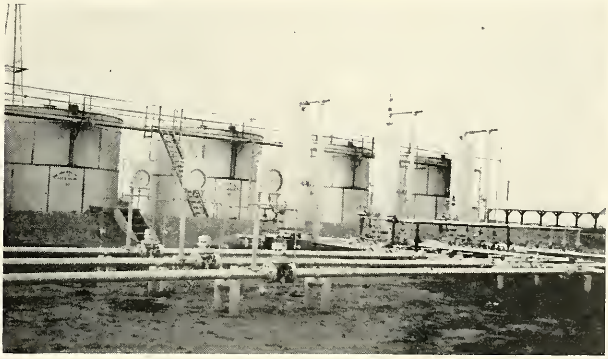
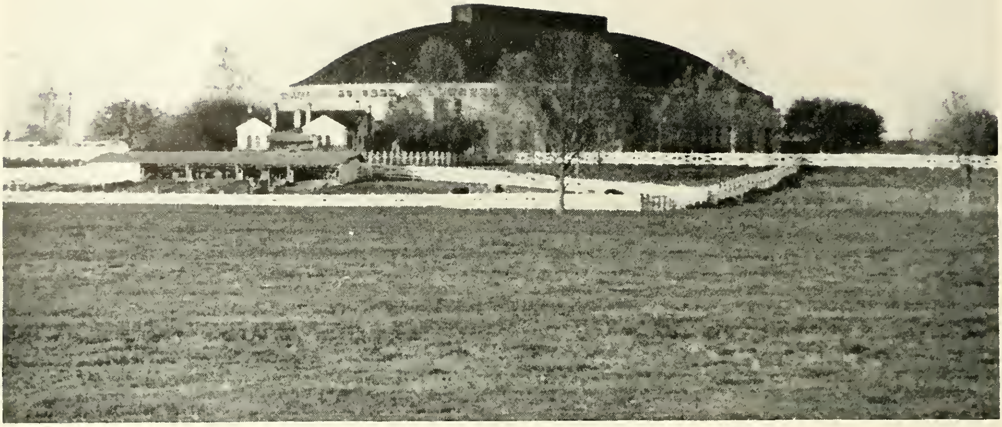


■ View of typical lease, Jennings field, showing storage tanks, separators and gas meters.



■ **The Coliseum of Louisiana State University stands on Prairie Terrace. The first white fence is the limit of the active Mississippi River floodplain. The upper white fence stands at the top of the scarp separating Prairie Terrace from floodplain. The corresponding scarp to the west lies just east of Opelousas.**

Louisiana and The Ice Age

By
Richard Joel Russell
*Professor of Physical Geography,
Louisiana State University*

Late in the story of geology, at a time when plant and animal life had reached approximately its present development, when continents had assumed their existing outlines and mountains approximated today's elevations, climatic changes occurred which greatly extended the glaciers in mountain valleys and brought conditions resembling those of Greenland or the Antarctic Continent to much of North America and northern Europe.

Ice ages have occurred many times during geologic history. The records of earlier periods of refrigeration are preserved in solid rocks. The records of the latest, or Pleistocene, are on the surface and are to be read from superficial deposits, topography, and drainage. The layman may see them as clearly as the professional geologist.

When one views the lower end of an existing glacier he sees a deposit of rocks of all sizes, irregularly heaped together, a terminal moraine. Boulders of any size, blocks of rock as large as a house may lie on, or within, gravels of small size, sand, silt, or even the finest clay. Poor sorting of this kind is typical of glacial deposits for the reason that ice is capable of carrying anything that falls on its surface or that is dislodged from the soil or rock below. Anything carried is dropped when the ice melts and remains on the surface as a moraine. Most melting occurs at the lower end of a glacier and so most moraines are "terminal." Water or wind currents are also important transporters of rock débris, but slackening currents drop their load in accordance with size of particles. A current too feeble to transport gravel may still carry away silt and sand. Water or wind deposits are typically nicely sorted in accordance with size.

The last ice age (Pleistocene) happened such a short time ago that its details are evident over vast regions and may be observed freely. A casual glance at the map shows that most of the existing lakes on earth are either in mountains or else in northern North America or northwestern Europe. Many of these are basins scoured in bedrock by the weight of overlying ice-caps, for example, the thousands of lakes in central Canada, or of Finland. Others are basins left in the disordered topography of moraines. For examples we may turn to the many lakes and ponds of Wisconsin, Minnesota, or northern Germany. Morainal dams across valleys in regions of rough topography cause such elongate lakes as characterize the mountains of Sweden, north and northwest of Stockholm, or western Montana.

EFFECTS OF GLACIATION

The surface of the region covered by Pleistocene ice-caps is still dominated by the effects of glaciation. There is a tremendous contrast between the regularity of a country long covered with vegetation and subject to the eroding action of rain and streams and the irregularity of a country subjected only a few thousand years ago to a cover of ice resembling that of Antarctica. In the United States this contrast exists between the territory north of the Ohio and Missouri rivers and that to the south. To the north are blocked drainages, with their ponds, lakes, marshes, and disorganized stream patterns, the irregular stony soils and unpredictable outlines of moraines in both plan and elevation, and such things as erratic blocks of rock, possibly standing alone on a surface hundreds of miles away from the place where dislodged from the crust. Such characteristics of northern landscapes disappear from the scene as soon as one crosses southward to regions never covered by Pleistocene ice.

Far south of the southern limit of glaciation, Louisiana too underwent radical changes during the ice age. For one thing, advancing ice, say from central Canada toward the Ohio River, drove plants and animals ahead of it. The advance was slow but positive. Animals are mobile but most kinds of plants may travel across country only gradually, as seeds are ordinarily scattered only for relatively short distances and each seedling requires stability of environmental conditions sufficient for the development of individual plant maturity. Trees today confined to regions north of the Great Lakes, or to the highest parts of the Appalachian Mountains were living in Louisiana during the Pleistocene. In West Feliciana Parish, for example, white spruce, larch, and white cedar occur as fossils in deposits several feet below the surface.[1] Complete limbs, with all twigs and cones intact demonstrate beyond question that such trees were actually growing in the vicinity, not brought in from afar as driftwood. Still living as relicts of ice age times are many northern plant types now confined to very restricted localities in Louisiana. The Tunica Hills are relatively rich in such "disjunct" species, plants barely holding their own, or disappearing, as the result of an environment unsuited to their best development.

■ Alumni Hall at Louisiana State University stands on the Prairie Terrace. In the foreground is the lower level of the active floodplain, on which the Stadium has been built. The scarp between these levels is only about fifteen feet high in this vicinity, but near Angola amounts to over one hundred feet.

LOWERING OF SEA-LEVEL

The topography of Louisiana is today largely the result of glacial oscillations in sea-level. The water tied up in Pleistocene ice-caps originated in the world's oceans and its extraction resulted in a universal lowering of sea-level. When the ice-caps slowly melted, sea-levels again rose to a more normal position. As a maximum the lowering amounted to about 300 feet.[2] Shiftings in sea-level happened not once, but several times. A close study of morainal deposits long ago indicated that the Glacial Epoch witnessed several advances in ice-caps, separated by "inter-glacial stages." The world during at least one of these inter-glacial stages was more ice-free than it is today. Time since the last glaciation is called the "Recent" by geologists and may represent the actual termination of ice-age conditions, but it may also be nothing more than another inter-glacial stage.

During each glacial stage, low-level seas permitted the Mississippi, Sabine, Pearl, and other rivers to cut trenches in their former valley floors (floodplains). Back-swamps and coastal marshes were drained and ravines cut back into higher lands with vigor. A prolonged stage of this kind extended all streams and lowered valleys so that Louisiana assumed a more rugged topography than it has today.

During each inter-glacial stage, rising seas ultimately approximated today's levels. The valleys cut during glacial advances gradually filled and their flat floors extended far inland along the courses of streams leading toward highlands. Mobile Bay illustrates the process nicely. The Recent rise in sea-levels has been so rapid that waters from the Gulf of Mexico now drown the old valley cut during the last stage of glaciation and penetrate inland as an estuary. The gravel, sand, silt, and clay brought into the bay by its several tributary rivers, however, has accumulated as an estuarine delta which has effectively filled the northern part of the bay, converting a large area of old estuary into tidal marsh and upstream regions into floodplain "bottom land."

■ South of Baton Rouge, the water tower stands on the level of the Prairie Terrace, the plowed field in the foreground on the recent floodplain. Similar breaks in topography, or scarps, separate each pair of higher terraces.

STATE SLOWLY TILTED

While the Pleistocene valleys of Louisiana were being alternately cut and filled,' in response to alternate advances and retreats of continental ice-caps, the State was being slowly tilted in such a way as to increase its gulfward slope. This action has gone on and will continue as long as the Mississippi River and other streams pile up heavy weights of sand, silt, and clay in their delta regions. Under existing conditions the Lower Delta region of the Mississippi River receives an average daily burden of some two million tons.[3] This is the equivalent of about one-tenth cubic mile of solid silt per year and if this material were spread over the floor of waters adjacent to the delta it should mean the addition of about thirty square miles of land per year to the coast.[4] The combined areas of Plaquemines and St. Bernard Parishes have remained about constant during the last century, apparently diminishing slightly, certainly not gaining the 3,000 square miles indicated by the volume of Mississippi River deposits. The added land along the sides of advancing passes at the river's mouth plus that formed below crevasses is neutralized by the loss caused by the gradual sinking of all parts of the Lower Delta, a process which continually erases area from land not subjected to overflow. Crevasse deposition is spectacular. Garden Island Bay, for example, has been filling so rapidly that its shore has advanced seaward at an average rate which amounted to 1,262 feet per year between 1891 and 1921. Less evident is the gradual gnawing back of shores by waves and regional subsidence of land to below sea-level, but the results are equally as significant.

RIVER DEPOSITS BUILD DOWNWARD

The reason that the Lower Delta tends to maintain a constant area is that, on the whole, the river deposits are building downward, into the earth, instead of outward, into the Gulf. One layer accumulates over the next and younger deposits on top depress the older deposits below. Two possible reactions occur as the result of this action. Material at depth may be compressed, or it may move outward from the loaded region. Both reactions occur. Compression causes the deposits to become more compact and rock-like. Outward flow causes some of them to move northward, under the continent. Geologists speak of this latter reaction as isostasy. The removal of soils and rocks by erosion in mountains, hills, and interiors of continents lightens the downward pressure, or weight, in those regions. When these same materials are deposited in delta regions they increase the downward pressure, or weight, there. Isostatic compensation refers to the back-flow at depth, starting at loaded regions (deltas chiefly) and working back toward the regions of load-removal (mountains, hills, and interiors of continents in general). Inland regions tend to rise in elevation as a result of this sub-crustal flow and this tends to neutralize the effect of erosion in lowering the land. Delta regions find the earth's crust unable to hold accumulating loads and hence are prevented from extending hundreds of miles seaward from their present limits. Thus Louisiana is being tilted both as the result of subsiding layers of rock materials on the south and of rising elevations of land northward. This is not wholly a matter of recent geologic history but is a fact which has dominated the geologic structure of the State back as far as the times when the oldest rocks now found in its deepest oil wells were unconsolidated sands and muds on the surface of its floodplains or adjacent floor of the Gulf of Mexico.

FLOODPLAIN CHARACTERISTICS

The valley bottoms of streams flowing during the last inter-glacial stage no longer have slopes quite as gentle as those of existing streams. Over most of the State they form a second bench, or terrace, which retains many floodplain characteristics but is no longer subject to overflow. In northern Louisiana this terrace is located several tens of feet above active floodplains. Southward, where no longer confined between valley walls, it spreads out and becomes a broad prairie belt. Baton Rouge, St. Francisville, Marksville, Opelousas, Crowley, Lake Charles, and Bastrop are all located on this surface. Its gulfward slope finally carries it below the level of existing floodplains and marshes along a boundary which may be observed below Pontchatoula, Sorrento, Lowry (South of Lake Arthur), or at Hackberry.

Slightly steeper are the slopes of the second youngest inter-glacial floodplains and coastal marshes, which now form the next higher surface in Louisiana. Zachary, Montgomery, Pineville, Turkey Creek, Oakdale, and DeQuincy are all located on the second level. Still higher are two other terraces of even older inter-glacial stages. Bentley, Trout, Pickering, DeRidder, Forest Hill, and Glenmora are located on the lower of these and Dry Prong, Williana, and Union Hill on the upper. It is characteristic that the upper terraces are more gravelly and sandy than the two lower levels. Their sands have typically become oxidized to deep reds, whereas those of the lower levels are more commonly yellowish or buff.

The four most significant terrace levels of Louisiana have been named by Dr. H. N. Fisk[5], from youngest (lowest) to oldest (highest): Prairie, Montgomery, Bentley, and Williana. Their normal gulfward slopes in central Louisiana are about, 8, 5, 1.5 and 0.5 feet per mile, respectively. The normal slope of nearby active floodplains is about 0.4 feet per mile. The terrace slopes are steeper southward and more gentle farther north.

A very large part of Louisiana is included within the limits of the four inter-glacial terraces just described. Thus the advances and retreats of continental ice-caps have a real and practical significance in Louisiana's topography. A somewhat curious result of the investigations being carried on by members of the Louisiana Geological Survey is the increasing probability that a better outline of glacial history may be read from the surface of Louisiana than from that of northern states which were actually under the ice cover.

The present floodplains and four inter-glacial terraces indicate a total of five glacial advances. The differing degrees of slope of these surfaces is a key to the antiquity of each. The depth and extent of fill in each system of glacial valleys is furnishing clues as to the relative lengths of each period of ice cover. Though our investigations are far from complete and our conclusions are only tentative, it appears that the Louisiana record harmonizes closely with results obtained by geologists in the north-central states and that in broad outlines the history of the ice age may be tabulated as follows:

Stage (North-central states)	(Louisiana)
Recent (Post-glacial)	Floodplains of valleys and existing delta, coastal marshes, etc. at present sea-level.
Late Wisconsin glaciation	Valleys cut about 100 feet below present sea-level.
Peorian Interglacial	Prairie Terrace.
Early Wisconsin glaciation	Valleys cut to maximum depths (indicating lowest sea-levels and maximum ice cover) of about 300 feet.
Sangamon Interglacial	Montgomery Terrace.
Illinoian glaciation	Valleys not as deeply cut as in the succeeding glaciation, about 100 feet deep.
Yarmouth Interglacial	Bentley Terrace.
Kansan glaciation	Valleys cut about 80-100 deep in central Louisiana, relatively gentle sides suggest a long period of cutting.
Aftonian Interglacial	Williana Terrace.
Nebraskan glaciation	Broad valleys about 80-100 deep in central Louisiana.

[Turn to Page 18.]

■ A familiar scene in Louisiana at this season, when the toothsome crawfish rewards the fisherman's industry.

WHERE TO FISH IN LOUISIANA

For Crawfish

By
Percy Viosca, Jr.

Springtime is crawfish time in Louisiana; in fact the season is well underway by the time Spring officially arrives on the calendar. These savory crustaceous begin to appear in quantities with the first signs of Spring, usually in February, but sometimes as early in the year as January or even late December.

The bulk of the edible catch consists of one species, *Cambarus clarkii*, the red swamp crawfish; but another species, *Cambarus blandingii*, the large whitish river crawfish, is equally delicious. Several other species are taken for bait but most of these have too little meat for human consumption. A few crawfish are taken for food in Arkansas and in the river districts of Western Mississippi, but virtually 99% of the entire edible crop is taken from Louisiana waters.

In order to make a good catch of crawfish, the amateur should take his tips from the commercial fishermen. At the first peek of dawn these fishermen are up and about and reach the swamps by car, truck, motorboat or pirogue. The crawfish live in shallow water and after leaving the conveyance, the fishermen usually wade, or may reach the fishing grounds by poling their pirogues. The usual costume is an oil skin jacket and hip boots. The most efficient crawfish net is a simple affair, the "Creole crawfish net." This is a frame of two wires forming inverted V's whose planes are at right angles to each other. Suspended from the four ends of wire at the bottom is a square piece of netting about 15 inches on each side. These nets are baited with "La Rotte," beef spleen, and set out in shallow swamps. The fisherman stirs up the water around each net with his boots or a stick in order to disseminate the flavor of the bait over the surrounding area. Each fisherman usually runs a line or circle of nets, usually about 25 or 50. Each is marked in some way, usually by a piece of white or colored cloth, for identification and to make them visible on dark days. It takes about 15 minutes to make a "round" of the nets, the fisherman resting only for a short interval between rounds, for if a crawfish has time for a full meal he will leave the net.

Each net is raised by means of a stick or cane, and the catch dumped in a basket or hamper. After each round, the contents of the basket or hamper are dumped in a gunny sack which is kept either at the edge of the swamp, on some high spot or log, or in a pirogue. A good fisherman may collect 100 to 200 pounds in a morning in a good location.

In order to know when to plan a successful crawfishing expedition one must know something of the habits and life history of the species involved. Both the swamp and river crawfishes have approximately the same seasonal relationships.

MUD-LOVING SPECIES

The red swamp crawfish is found in all parts of the state where there are fresh or slightly brackish water swamps, marshes, lakes, ponds and ditches. It is an inhabitant of shallow water, so in deep bodies of water it only frequents the shores. Being characteristic of the alluvial lands of Louisiana, it is a typical, mud-loving, species. Attaining maturity in four to six months, the adults average about 3½ inches in length, some being as small as two inches, while occasionally specimens may attain lengths of over four inches.

The river crawfish is found chiefly in areas flooded by backwater from the Mississippi and its tributaries and in rice fields irrigated with water from these streams.

Mating usually takes place during late spring. The eggs are not laid, however, until summer is well advanced. When laid, the eggs become attached to the swimmeretts under the abdomen of the mother and here undergo development. They are so close together that the mass resembles a blackberry, so females with eggs are said to be "in berry." Hatching takes place in about 15 days. The larvae at first do not closely resemble the adults but soon develop into the young form familiar to most Louisianians. During early October most females are either "in berry" or carrying their young. The majority of young are born about the time of the heavy rains of the Autumnal equinox and are scattered far and wide by high waters. At this time the adults are migratory and may be seen crossing the highways traversing the swamps, especially at night, in armies of tens of thousands. They are killed by automobiles in such quantities that the roads become greasy with them. Many birds and animals attracted to the feast are also killed on the highways. These migratory adult crawfish are not fit for human consumption.

During the late fall, little is seen of the adult crawfish as they have become extremely scarce, a heavy toll having been taken by water birds, fish crows, etc. during their perambulations. At this time the young are scarcely noticeable unless looked for, because of their small size.

The fall and winter temperatures in Louisiana are seldom cold enough to seriously retard the growth of young crawfish, and then only for short intervals. By the end of December, all ponds, swamps, ditches and other localities favorable for their development are teeming with thousands of young, varying in size from babies to medium sizes. At the same time most of their natural enemies are inactive because of their great susceptibility to cold. By January some of the young have already reached edible size.

VORACIOUS FEEDERS

Young crawfish are voracious feeders during their fast growing period and are excellent scavengers. They eat animal and plant material of all kinds. They are fond of the Spanish moss which falls from the cypress and water gum trees of their habitat. The bulk of their food in nature consists of the common water plants of their haunts, such as algas, water weeds, arrowheads, and water hyacynths, and it appears that they are one of the major factors in preventing excessive growths of such vegetation in shallow waters, thus allowing the fish and other aquatic life of those areas to move about in the pursuance of their normal functions. In spite of the abundance of their food supply, the geometical increase of the species is self limited, as they are avowed cannibals and nothing is preferred by a crawfish more than a soft shelled specimen of his own species.

Young crawfish are somewhat of an amber grey color and are thinner shelled than the adults, and their claws are not as powerful. Toward the approach of spring, February in the southern part of the State), large numbers of young have already reached edible size. Transformation from young to adult takes place during the spring. During very early life, crawfish are thoroughly aquatic in their habits and secure all their oxygen from the water. As they grow older, they require more air and frequently climb to the surface or approach the shallow edges of swamps. Here they may be seen frequently exposing their gills directly to the air, lying on one side as they do so.

THE CRAWFISHING SEASON

It is the young crawfish just before maturity that constitute the major market crop. These are tender, of more delicate flavor, and possess the greatest amount of edible meat. As this period, with the majority of crawfish, is passed between early February and the end of April, this is considered the ideal crawfishing season, the young being always hungry and readily taking to baited nets. The young have greater muscular development, are more agile, and escape enemies by rapid snapping of the tail which propels them swiftly backward. In the adults muscular development is sacrificed to sexual development, and the animals become sluggish, secretive in habits, and less adapted to aquatic life, living largely in burrows and protecting themselves with their claws. After May in South Louisiana or June in North Louisiana, it becomes more difficult to find crawfish in any quantities except in the harder shelled adult stage, with less edible tail meat, and with the fat used up with the development of the sexual organs.

■ A favorite Louisiana dish is crawfish bisque.

* * *

Did you ever hear the old Shoshone Indian folk tale about the coyote? The first coyote said, "I'm not a coyote."

The second said, "You are too."

"You watch," said the first. "I'll follow you by that Indian camp."

When they went by, the second following, the Indians said of the first, "There's a coyote." When the second went by, they said, "There's another." So the second coyote said "I'm not a coyote at all. "I'm 'another'."

* * *

Louisiana and The Ice Age

[Continued from Page 16]

Even prior to the ice-age, equivalents of the Mississippi River and other streams now entering the Gulf of Mexico along its northern shore were concentrating débris eroded from over one-half of the United States in the vicinity of what is now Louisiana. The total depth of these deposits appears to be at least 30,000 feet, and it is in such thick sedimentary accumulations that petroleum originates. The tilting of the rocks in this series resembles but notably exceeds that of the Pleistocene terraces and favors the migration of petroleum "up-dip" to favorable "structures" or to the sands of old shore-lines in which it may be trapped for exploitation in commercial amounts.

The geologist's maxim, "The present is the key to the past" is clearly brought out in the story of Louisiana geology. From a study of surfaces as recent as those of Pleistocene interglacial stages we gain an insight into physical principles useful in extending geologic knowledge to depths far below the surface and into fields of greatest economic consequence to the people of Louisiana.

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Confiscation In The Guise Of Alleged Property Title

A Proposed Infringement Of Individual and States' Rights by the Federal Government

■ **Operations of Superior Oil Co., Creole field, Cameron Parish, Louisiana, would be in the contested area.**

H. J. Res. 176 and H. J. Res. 181, introduced in the House of Representatives by Congressmen Hobbs and O'Connor and referred to the Committee on the Judiciary, is of paramount interest to the people of Louisiana and our State Department of Conservation.

This resolution relates to the establishment of title by the Federal government to certain submerged lands within the three-mile limit, lying along the coast of the United States, the object of the proceedings being to obtain possession of large petroleum deposits.

Commissioner William G. Rankin has submitted to the Louisiana senators and congressmen his views on the subject, contending that the resolutions propose an infringement of individual and States' rights by the Federal government. He wrote as follows:

While this resolution has the support of the U. S. Navy Department, which is especially interested in the petroleum reserves of the California coastal waters, the establishment of such a precedent makes the adjudication of the issue one of vital importance to Louisiana as well as other states of the Union.

I must leave a discussion of the strictly legal technicalities and implications of the issue to the Committee on the Judiciary, which will doubtless have the benefit of expert opinion, but I would like to point out some of the more obvious objections, which may impress the lay mind, to such proceedings on the part of the national government.

Let me say at the outset that such proceedings would constitute an infringement of our individual rights and liberties, which have been safeguarded to us by the Federal Constitution, and also certain inalienable States' rights which were recognized and guaranteed by the founding fathers.

This question of States' rights has been bitterly fought from the very beginnings of the Republic, as it was the apparent ambition of our forebears to build a strong centralized government without a sacrifice of the individual State identities and characteristics and without depriving the latter of certain rights and benefits.

STATES' RIGHTS PRESERVED

From the first Confederation of the original States there was never any question as to the proprietorship of the State within the three-mile limit. Long before the value of our petroleum deposits was even suspected the fishermen of our coastal waters, from Maine to Georgia, were operating under a license from the State, for the benefit of the State and its people.

If there had been any question as to the rights of the State within the three-mile limit, it would have been contested in the beginning, when so many issues were fought through the courts. If for no other reason than that the lapse of years has weakened or destroyed any property equities that the Federal government may have enjoyed in the beginning, a precedent has been established that may not readily be ignored.

It is true that the founding fathers provided for such an abrogation of States' rights, but only in times of war emergency or through an amendment of the Constitution by a majority vote of our people. Such amendments were recorded in the emancipation of the Negro, woman's suffrage, prohibition and its repeal. But no such method of procedure is here suggested or contemplated.

As a matter of fact the Federal government has always been so sensitive about the infringement of States' rights that it has hesitated to exercise its police and punitive powers where these powers encroached on those of the individual states. Notorious gangsters have been prosecuted for income tax evasion because their more violent crimes were localized within the boundaries of the State.

THE POSSIBLE EFFECTS

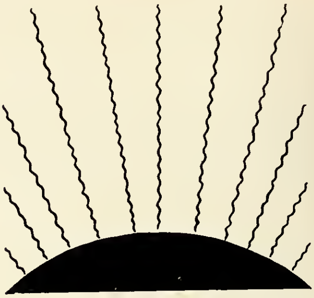
On the practical side let us consider the possible effects of any decision in favor of such confiscatory proceedings. If the Federal government were legally entitled to these petroleum deposits, it would be entitled to other natural resources that have heretofore been regarded as the property of the individual States, such as our salt water fisheries, oyster beds and other valuable sources of revenue.

Further, if the Federal government were legally entitled to these petroleum deposits, it would also be entitled to recover the value of previous production from these submerged lands within the three-mile limit, which would of course open up a vast field for controversy and litigation.

[Turn to Page 38]

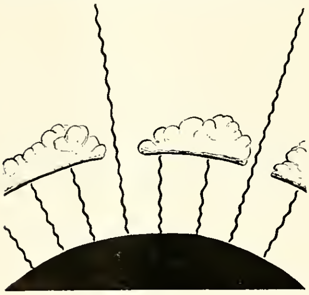
The Weather—Mark Twain Was Right

By
S. M. McDonald



■ **Fig. 1. Radiated heat from the earth passing outward into space.**

Have you ever stopped to think of the earth as a huge radiator? Actually, it may be so considered, for each moment it is losing great quantities of heat by means of radiation. The sun may be thought of as the boiler or central heating plant, for it supplies most of the heat to the surface of our earth. Louisiana's surface, alone, each day receives heat energy from the sun equivalent to the burning of ten million tons of coal!



■ **Fig. 2. Interception and conservation of radiated heat by cloud particles.**

Our atmosphere serves as an intermediate medium which insulates the earth and prevents rapid changes from extreme heat to extreme cold with each day and night.

The sun supplies heat each day to us and the earth and all that is upon its surface absorbs some of this heat; then the earth, in turn, releases a greater portion of the absorbed heat by means of radiation. This radiation of heat from the earth is actively going on both day and night and maintains a constant heat balance affected in general only by seasonal changes.

Wherever the sun is shining on the earth, the amount of absorbed heat is greater than the amount radiated and the temperature always rises during the daylight hours. With the setting of the sun, however there is no supply of heat energy to compensate for that being lost from the earth by radiation, and it is always at night that the cooling effects of radiation are most apparent to our senses. Our sense of earth temperature is governed by the temperature of the air which contacts our bodies.

When the air is calm the cooling effects of radiation are most readily observed. Winds, though they do not prevent radiation, keep the air in constant turmoil so that no particular portion can be cooled to a greater degree than any other. Also, dust or smoke particles are quite effective in absorbing and reflecting radiated heat, and their presence in the air prevents appreciable cooling by radiation. It is relatively warmer when the atmosphere is dirty, smoky, or dusty.

The accompanying diagrams may better illustrate the simple mechanics of radiation from the surface of the earth.

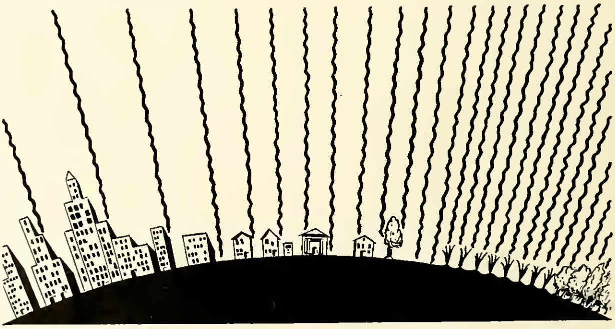
Figure 1 represents waves or radiated heat leaving the earth's surface and travelling outward into space. If the air contains only a little dust, smoke, or water, these rays of radiated heat lose only a small part of their energy in passing through the atmosphere and they carry most of the heat out into space to be lost from the earth. In this manner, when the night air is clear, the earth's surface is rapidly cooled and the surrounding air, in turn, also loses heat on contacting the cooled surfaces.

Frequently, an area may be shielded by a cloud blanket in the sky. If this should happen, the radiated heat from the earth is absorbed or reflected back by the lower side of the cloud mass, as shown in Figure 2. When this condition is true, there is a conservation of heat energy by re-absorption of the reflected radiation.

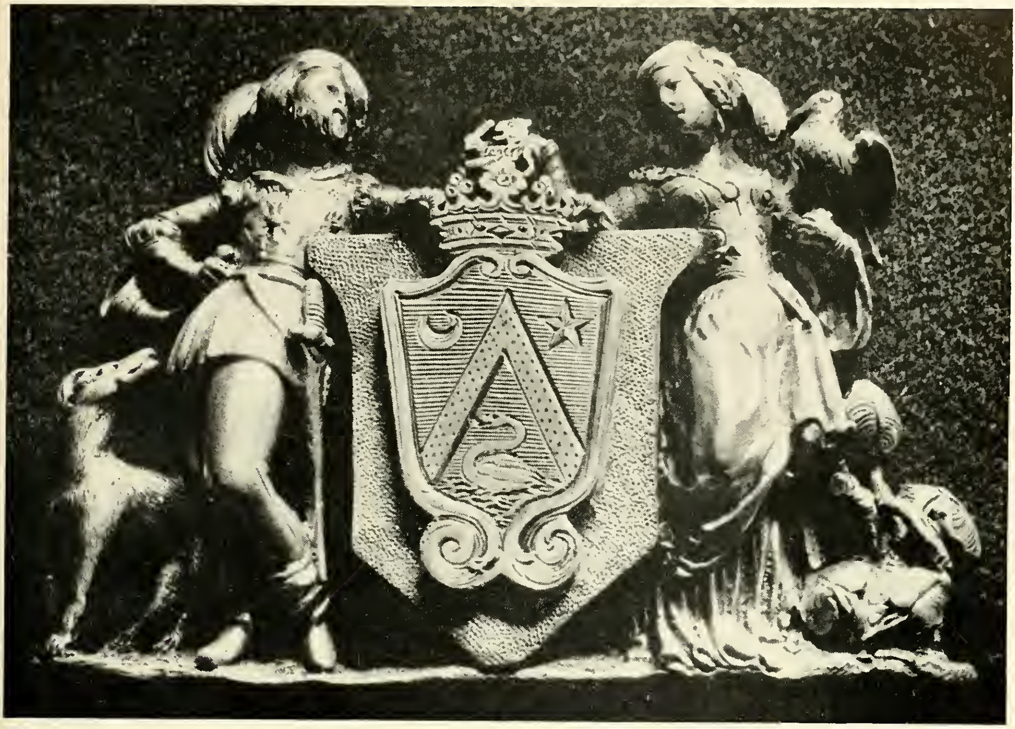
The rate of radiation from any portion of the earth is controlled to a large degree by the nature of the objects on the earth at that place. Buildings and houses act as insulation, interfere with normal radiation by interrupting the paths of heat rays, thus preventing their escape directly into space and protecting the local area from rapid cooling. Regions of dense vegetation afford increased areas of radiating surfaces which aid in the escape of heat by this means, and the temperatures in such regions are found to drop more rapidly than in towns and cities.

In Figure 3 the relative amount of heat lost by radiation is represented by the density of rays shown over any particular area. This diagram presents the contrast in relative amounts of heat lost

[Turn to Page 38]



■ **Fig. 3. Relative loss of heat by radiation over various areas represented by density of "rays."**



■ The Arms of the Marigny Family On A Medal[1]

The Family of Marigny de Mandeville and The Fontainebleau Plantation 1700-1938[2]

A BRIEF CHRONOLOGY OF THE TCHEFUNCTE PARK AREA

By
Clarence L. Johnson*

PART III[3]

1814. In July, Bernard Marigny was elected a Representative from the County of Orleans.[4] The First Session of the Second Legislature met in New Orleans on November 10th, and did not adjourn until February 6th, 1815.[5] This was a special Session which met in compliance with Governor Claiborne's Proclamation of October 5, to consider "great and weighty matter".[7] On November 11, Marigny [County of Orleans], Caldwell [County of Rapides], and Roffignac [County of Orleans], were named as members of The Special Committee of Defense.[8] On the 14 of November, the Senate named Garrigues Flaujeac and Daniel B. Morgan to serve on "the said Committee of Defense".[9] Caldwell was not certified by the Committee of Electors, and his place was declared vacant on the 27th of November and Mr. Thomas [of the Parish of St. Mary] replaced him. The legislature attempted to cooperate with General Jackson and Governor Claiborne in the prosecution of the defense of New Orleans, but with little success.

Eaton says disparagingly:[10]

> Only four members of the legislature appeared in the field to defend their country. We regret not knowing the name of one of these persons; those we have learned are, General Garrigue Flojock, [Garrigues Flaujeac] Major Eziel and Mr. Bufort, [Thomas Buford, Representative from Concordia Parish] who abandoned their civil duties for the field, where they afforded examples worthy of imitation.

In 1848 Marigny wrote a pamphlet entitled, *Réflexions sur la Campagne du Général André Jackson en Louisiane en 1814 et 1815*, from which the following is quoted:[11]

> I ought to make known what had been my line of conduct in New Orleans at the time of the war.
>
> General Jackson had been at Pensacola. He had seen there, Mr. Morales, my father-in-law, who was governor of

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* Senior Foreman Historian, National Park Service, Tchefuncte State Park.

the Floridas, who gave him a letter for me, in which he bestowed great praise on Andrew Jackson. On arriving at Bayou St. John, the General handed the letter to Inspector Davis of the Tennesseeans, to give it to me. The Inspector was accompanied by Mr. Laneuville, an old officer in the army of the United States, then Adjutant General of the State of Louisiana. I was speaking with Mr. Nathan, who is still at New Orleans—we were standing at the corner of Chartres and St. Louis Streets, when Inspector Davis handed me the letter of which he was the bearer. As soon as I read it, he told me that General Jackson asked me if it would be agreeable for him to descend at my home on the morrow and to establish there his headquarters.

I was then living in a large house near the railroad, [the Pontchartrain Railroad, which was not built until 1831] which has since been demolished. I replied to Inspector Davis that I would receive him at my home with great pleasure, the Conqueror of the Floridas, and of Colonel Nicholls [sic], who had maltreated my old compatriots in Pensacola and had carried away a great number of their slaves. Finally I told him that I would receive the General the next day after the review that he proposed to make of the *Battalion d'Orléans* and of the Militia of the city on Esplanade Street, and that breakfast would be awaiting him. I entered at once in my home and commanded it. The drawing room of my house was spacious and nothing was neglected, in order that the reception should be worthy of the General and the officers who accompanied him. I waited therefore for the General. Towards midday, not seeing him come, I went to the rampart of Fort St. Charles, which dominated the Esplanade. There an Attakapas Dragoon, Mr. Pelletier Delahoussaye, came and told me that the General had changed his mind and that he would remain at Dr. Kerr's on Esplanade Street. I was astonished. I understood however, that among the individuals who had hastened to meet General Jackson at the head of the Bayou, there were men whose ambitious views had often been disappointed by those who defended the rights of the ancient inhabitants of the Country, and who sustained with justice that one should rejoice at being a citizen of the United States, without on that account replacing the Civil Law by the common law, without changing the names of the Streets, and without giving to the state the name of Jefferson, instead of Louisiana. So that in the civilized world we would be forced to say not "a beautiful Louisianian", but a beautiful Jeffersonian.

I thought however, it was my duty to go and pay a visit to the one who had been destined to be my guest. I went immediately to the General, to whom I was presented by my old friend Colonel Peire, who should remember all these circumstances. The General received me cordially. I was then 29 years old and it is easily imagined that if the General had come to my house and had offered me service in his staff I would have accepted his offer. I decided to enter the staff of Governor Claiborne, who commanded the militia of the state and there I found myself with Messrs. Octave LeBlanc, L. B. Macarty, Laneuville and others.

On the 23rd of December, the militia received the order to advance first to meet the army. Arrived before the Macarty Plantation, Colonel Chambord came to say to Governor Claiborne that the General had changed his mind and that he must go to Marigny Canal on the Gentilly Road, where he would find Lt. Bosque with the artillery. We met at the corner of Rampart and Bayou Streets the Orleans Battalion, which was coming to meet the English. Arrived at Canal Marigny, we heard the first shot of the cannon from the U. S. ship "Carolina". I addressed Mr. L. B. Macarty, and told him "We were expected to be in the battle; do you wish that we should go there?"

He consented, but the distance from Canal Marigny to the Lacoste Plantation being at least three leagues, we only arrived at the end of the battle, which lasted about two hours. We saw under an oak by the side of the road that goes through the length of the Laronde Plantation, a number of wounded who, I think, belonged to the 7th Regiment, commanded by Colonel Peire. The American army was retiring on that line. The first person that I met was Major Gabrielle [sic] Villere, and a few minutes afterwards, Colonel Peire, who told me he had been struck in the hand by a spent ball. He conducted me at once to General Jackson, who asked me what was taking place in the City. I told him that all the citizens were under arms and that General Carroll, with his soldiers, were ranged in battle order on the Levee of New Orleans. The General announced to me that the affair had been very hot.

I departed at once for the City. Mr. L. B. Macarty took the road to Gentilly to go and give the news to Governor Claiborne. As for me, I had to make known to the City of New Orleans that neither General Jackson nor those of his army had been wounded, which gave us great cheer. A few days later, Governor Claiborne handed over all the militia to General Jackson. They were placed in different commands. Thenceforth, I remained with the Legislature, where moreover I had much to do as president of the Committee of Defense named by the Chamber. I was incessantly in relation with the General-in-Chief, in order to make known to him what we could do to serve the interests of the Country and to receive his advice and his commands. It can be seen therefore, that I might, like many others, wear the blue ribbon on great occasions, but not having been in the fire of the enemy, neither on the 23rd of December nor the 8th of January, I think differently.

In 1853, Marigny wrote a pamphlet entitled, *Bernard Marigny à ses Concitoyens*, in which he describes his part in securing the services of the Baratarians for the defense of New Orleans.[12]

During the campaign of 1814 and 1815, I acted as chairman of the Committee of Defence, appointed by the House of Representatives, to place at the disposal of Gen. Jackson, all the available resources of the State. The Committee had an interview with Gen. Jackson; I told the General that he had announced in his proclamation, issued at Mobile, that he would not accept the services of the inhabitants of Barataria, whom he had qualified as pirates; the General then got excited, and told the Committee that those men were under the ban of the United States laws, and he declared that he could not enroll them under the American flag. Being aware of the violent and excitable temper of the General, I did not think proper to insist. I left him, and called immediately on Judge Hall, of the U. S. Court; I related to him, the conversation held with Gen. Jackson, and his determination as regarded the Baratarians. The Judge said, that he would take the matter in hand, as it was within his province. He drafted some resolutions, which he requested me to offer in the House of Representatives; the purport of those resolutions was, that he (the Judge) was requested by the Legislature to suspend all criminal action against those men, for the term of four months. "As soon," said he, "as those resolutions are adopted, I shall order the U. S. District Attorney to suspend all proceedings against them; and if they assist our cause bravely and faithfully, I have no doubt but that the U. S. Government will pardon them. Before four months, we shall be either victorious or vanquished; in the latter case, all connexion between them and us will cease." The resolutions were offered by me in the lower House and passed there, and in the Senate unanimously. Those men behaved bravely and gallantly during the war. Five of the pieces of artillery used in the campaign, were manned and directed by Dominique You, Cadet Bouteille; the brothers Lafitte, Gamby and Beluche. It is an incontrovertible, historical fact, that the artillery was most efficient in the memorable campaign of 1814 and 1815.

1815. The following notice is interesting not only as an example of advertisement of Slaves for sale but for the use of the word "Creole" in an uncommon manner, as Marigny himself wrote letters to the Newspapers and signed them "A Creole".[13]

NOTICE—The public are hereby informed that on the 1st of February next, at 11 o'clock, A. M. at Maspero's Coffee house will be sold,

100 Slaves

Belonging to the undersigned, and who are now on the plantation sold by him to Mr. Joseph Decuir—Those slaves are too well known to need any further details about them; suffice it to say that there are among them ninety Creoles of from 15 to 32 years of age, a great number of whom have trades—Their qualities and vices will be made known.

Conditions—Payable in March 1817, in notes endorsed to the satisfaction of the seller, with mortgage until final payment—The deeds of transfer to be at the exchange of the purchasers.

B. MARIGNY

1816. Marie Angela de Marigny, third child of Bernard Marigny and Anne Mathilde Morales, born on January 19.[14]

1820. Agnes Mathilde de Marigny, fourth child of Bernard Marigny's second marriage was born on January 21.[15]

1822. Bernard Marigny was elected president of the Senate of the Louisiana Legislature on January 8.[16]

On March 16, 1822, Marigny addressed the Senate as follows:[17]

Gentlemen of the Senate—Having it in view shortly to visit Europe, I consider it a duty incumbent on me, in order to avoid such inconveniences as my absence from this state might otherwise create,

■ **Heirlooms of the Marigny Family.**[6]

> to tender you, on Monday next, my resignation of the office of President of the Senate. I wish you, gentlemen, to be well assured, that I shall ever remember, with due gratitude, the marks of confidence and esteem which were shown me by this honorable body, during the period I have been called upon to preside over it. They are, together with the proofs of friendship bestowed on me by yourselves individually, deeply and lastingly imprinted in my heart.
>
> Be pleased, gentlemen, to accept this expression of my sentiments, and of my ardent wishes for your happiness.

On March 18, Mr. Julien Poydras was elected to the presidency of the Senate and the following resolution was unanimously adopted:[18]

> Resolved, unanimously, by the Senate of the state of Louisiana, that the justice & impartiality which mark the conduct of the honorable Bernard Marigny while exercising the high duties of President, entitle him to the esteem and respect of the Senate, and the expression of their individual regard for him and wishes for his happiness.
>
> Resolved further, that this testimony of their feelings be presented to the honorable Bernard Marigny by the secretary of the Senate.

Marigny continued in the senate until it adjourned on March 23, as is shown by his vote on several bills.[19]

1824. Marigny was a candidate for Governor of Louisiana and received 1,420 votes running third in the race, Henry Johnson being elected.[20]

1828. General Andrew Jackson visited New Orleans and was entertained by the City. On January 8th, (the Anniversary of the Battle of New Orleans) a public dinner was given to the general at the Orleans Ballroom. Marigny presided over the dinner. *The Courrier*, in reporting the dinner, said "General Jackson arose, before taking leave of the assembly, and gave the following toast: To B. Marigny, president of the Banquet".[21]

Marigny was a candidate for Governor of Louisiana[22] but was defeated by Derbigny.[23]

1829. On January 22, Bernard Marigny bought the property described below from the heirs of Morgan Edwards.[24]

> . . . . . A certain tract or parcel of land situated in the said Parish of St. Tammany, composed of three different parcels, which devolved to the said five children of the said late Morgan Edwards, in equal interests as his sole legitimate heirs; and lay contiguous to each other, viz:—
>
> The first parcel containing seven Hundred and Seventy five arpens [sic], superficies, fronting on the Bayou Castain having also a front on the Lake Pontchartrain, the second parcel having Eight Hundred arpens [sic] superficies, forming a parallelogram and lying contiguous to the parcel before described, both of which tracts are fully described on the plot of survey made thereof by Charles Laveau Trudeau, Surveyor General, on the Eighth of January 1799, which plan being duly countersigned by the parties and me, Notary, has been delivered together with all the title to the lands herein sold to the present purchaser, as he hereby acknowledges. And the third parcel having five arpens [sic], front on the margin of the Lake, be the same more or less, extends in depth twenty arpens [sic] more or less, lays contiguous to the lands of Uriah Smith, and is bounded on the east by the two parcels first described: Together with all the improvements on said lands, and all the rights, privileges and advantages thereunto belonging or in any wise appertaining: And the said Attorney in fact, as well in his own name, as in his quality aforesaid, and the said Timothy Dow, in his own name & of the heirs of said parties, respectively, the said Lands and appurtenances, shall and will forever warrant and defend to the said Bernard Marigny, his heirs and assigns, against all persons whomsoever by these presents.
>
> This sale is made for Four Thousand Dollars . . . . .

The first parcel mentioned above is now Section 51, T.8S. R.11E and Section 46 in T.8S. R.12E. The second parcel is now Section 38, T.8S. R. 11E. and Section 45 in T.8S. R.12E; and the third parcel is Section 50 of T.8S, R.11E., all in the Greensburg District of Louisiana. This seems to be the first purchase by Marigny of property in this vicinity. Most of this property was later subdivided and became part of the town of Mandeville.

On June 25, Mr. Marcelin Bonnabel and Miss Amelia Bonnabel "residing in this city" sold to Mr. Bernard Marigny "also living in this city" (New Orleans) the property described below:[25]

> 1. A plantation situated in the Parish of St. Tammany, facing Lake Pontchartrain composed of three concessions

amounting to a total of Four Thousand and Twenty superficial arpents, according to a plan drawn on the Fifteenth of January, One Thousand Seven Hundred and Ninety-Nine, by the late Chas. Trudeau, then Surveyor General for the province of Louisiana; which plan as well as the titles to this land have been delivered by the vendors to the (Sieur) purchaser, who acknowledges them, together with all buildings which are on the said *habitation* and other circumstances and dependencies, without exceptions or reserves.

2. Two slave titles namely: John Peter, negro age about 32 years, and George, negro age about 33 years.

3. A herd of cattle of not less than five hundred and eighty-two head and more if found; plus the horses, hogs and chickens. The animals marked (I. 2) and (N. 3). (2). (3). the rights to which marks [probably brands] the vendors transfer to the said (Sieur) purchaser making him by this fact owner, having also turned over to him the said marks in stamps [probably branding irons].

Which plantation, which two slaves, apart from which animals belonging to said vendors by the acquisition which they have made in the proportion of two-thirds for the said (Sieur) Marcelin Bonnabel and one-third for the said (Dlle) Amelie Bonnabel, from Mr. James Philip Meffre Rouzan, according to act of the 14th of June, One Thousand Eight Hundred Twenty-eight, passed before the undersigned Notary, the surplus animals belonging to them by other purchases made at divers times.

The sale price was $7,098, one third was paid in cash and the balance in three equal yearly installments.

This tract of land (4,020 arpents) with another tract (774 arpents) bought on the same date and described below[26] comprised Fontainebleau Plantation as owned and subsequently defined by Bernard Marigny.[27]

Personally appeared, Mr. Marcelin Bonnabel, Miss Amelie Bonnabel, and Mr. John Louis Rabaud, the last named, a marriageable minor, duly assisted by the said (Sieur) Marcelin Bonnabel, his curator in goods:

Who by those presents, have sold, ceded, and transferred, from now on and forever, with guarantee against all trouble, gifts, debts, mortgages, evictions, alienations, and other impediments, generally whatsoever;

to Mr. Bernard Marigny,

residing in this city, herewith present and accepting, purchasing for himself, his heirs, and assigns; a piece of land situated in the parish of St. Tammany, in this State, containing seven hundred seventy-four superficial arpents, and fronting on Lake Pontchartrain, bounded on one side by the land of Mrs. Ford, hereinbefore belonging to Duriam, and on the other, to the one sold by act of this day in this office by the said (Sieur) Marcelin Bonnabel, and the said Miss Amelie Bonnabel, to the said (Sieur) purchaser, such, in fine that this land is found described on a plan drawn on the fifteenth of January, one thousand seven hundred ninety-nine, by Charles Laveau Trudeau, surveyor general, which plan is the same as the one mentioned in the above said act of this day, in this office, and was remitted with the titles to the said (Sieur) purchaser, who acknowledges them.

This land belonged to the sellers for having inherited it from the late Mr. Anthony Bonnabel, father of the first two vendors, and grandfather of the third, which said late Anthony Bonnabel had it from the late Peter Piguery, to whom he had sold it and who retroceded it to him, not having been able to pay the price.

And understood that a portion of land which is here sold, could be the object of some pretended reclamations by Mrs. Ford, or the Etourneaux heirs, as they are called, it is understood that in cases where against all attempts, the said claimants were to succeed, Mr. Marigny will have nothing to exact from these vendors.

It is believed that conclusive evidence has been shown above to prove that Bernard Marigny bought Fontainebleau Plantation in 1829 and it will be shown below that he made his first purchase of the property, later included in Mandeville, in the same year. Such statements as the following, which cite earlier dates for the purchase and give alleged activity there by the Marigny family prior to that time, are therefore not founded on fact.

A great deal of Bernard de Marigny's time, after his second marriage was spent on his estate, *Fontainebleau*, near Mandeville, which he purchased in 1820. There he entertained his friends with somewhat of the elegance for which his family was noted.[28]

Louis Philippe is said to have been entertained at Fontainebleau while in the United States. If he was it was probably not under the ownership of the de Marigny family, for the regent returned to France and was living in Paris when Bernard de Marigny purchased the plantation in 1820.[29]

Following the publication of the paragraph immediately above, there appeared a letter in the same paper which, after quoting it *verbatim*, said:[30]

I wish to state that Pierre Philippe de Marigny de Mandeville (father of Bernard de Marigny), was the original owner of the magnificent wooded tract, which for that reason he named "Fontainebleau," and that he had the honor of entertaining the Duc d'Orleans (Louis Philippe) and his brothers, the Duc de Montpensier and the Comte de Beaujolais, at Fontainebleau. At that time Bernard de Marigny was but 13 years of age.

Two years later, May 14, 1800, Pierre Philippe de Marigny died at his country home, Fontainebleau, and his body was transferred to the home of his cousin Madame Don Andres Almonaster, whence he was interred in the St. Louis Cathedral.

He left an estate valued at $7,000,000. Bernard de Marigny later became the owner of Fontainebleau through inheritance and was one of the largest property owners in Louisiana; he owned about one-third of the city of New Orleans. The Third Municipal District was called Faubourg Marigny. He was also the founder of the town of Mandeville, named after his family.

Further discussion of the Marigny Family and Fontainebleau Plantation appeared a few days later.[31]

These acres [Fontainebleau] did not come into the possession of the Marigny family until 1820, when Bernard de Marigny de Mandeville, a son of Pierre Philippe, purchased them from Antonio Bonnabel. [Bonnabel died prior to February 15, 1800—See his Succession at the Cabildo, New Orleans.] The Congress of the United States confirmed Bernard de Marigny's title by a special act in 1836 [should be March 15, 1832, as shown below] (Laws of the U. S. Treaties, Regulations, and other Documents Respecting Public Lands, No. 756, Vol. I p. 301 [should be Vol. II] entitled "An Act for the Relief of Bernard Marigny").

It was Bernard Marigny who, soon after its acquisition in 1820, gave the old Davis-Bonnabel tract the Old World name of Fontainebleau, because his son, Mandeville, who had been sent to France for military training, had served at the ancient French palace during the close of the Napoleonic period and during the short time when Louis Philippe was king.

In 1832 [should be 1829-1831 as shown below] Bernard Marigny purchased other properties on the north shore of Lake Pontchartrain, which he sold off in town lots, and named the small village Mandeville.

In regard to Fontainebleau Plantation, Grace King says:[32]

Marigny [Pierre Philippe de] purchased also a princely tract of magnificently wooded land on the opposite shore of Lake Pontchartrain from New Orleans which, in honor of its growth of trees, he called Fontainebleau. He built here the wooden cottage (of the modest New Orleans type) which still exists, where with his family and a great retinue of servants he was wont to pass the hot months of summer. . . . .

The banquets offered by the Spanish Governor are never mentioned in comparison with those of the splendid Philippe de Marigny—not only in New Orleans, but in Fontainebleau, where he also entertained his guests. The golden memory of them is still preserved piously in the little town of Mandeville, which naively claims for Fontainebleau the original honor of the fabulous (it is hoped) story that at a banquet given to the Princes, the cigar lighters passed around after dessert were hundred dollar bills! But the same incident, it must be confessed, is still claimed by New Orleans, where it is recalled with vividness that has not been suffered to become dull during the two centuries of brilliant functions that no doubt succeeded it.

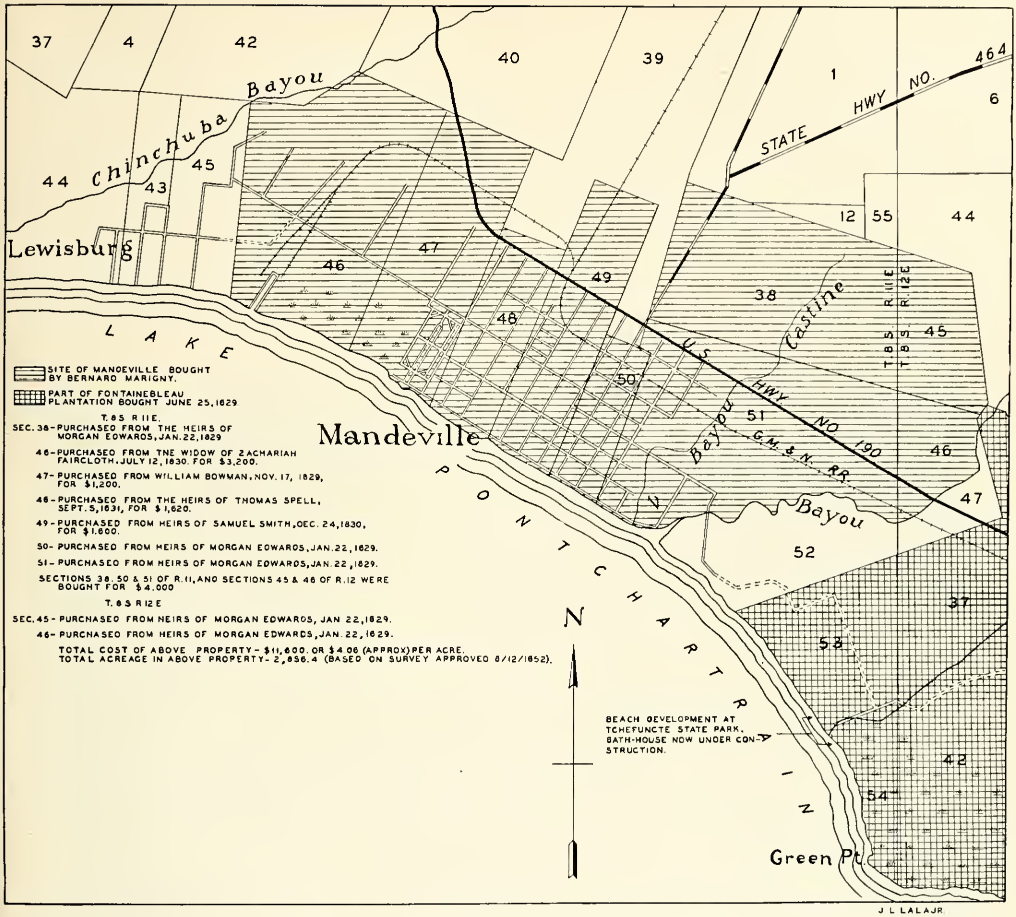
Pierre Philippe de Marigny, the magnificent and courtly citizen, died in 1800, two years later, at Fontainebleau. His body was transferred in state to the home of his kinswoman, Madame Don Andres Almonaster, whence it was interred in the Cathedral, according to his funeral notices, tacked, as was the custom, on the door of the Cathedral or the corners of the streets. One of them has been preserved.

"Messiers et Dames:

"Vous etes pries d'assister au convoi et a l'enterrement de feu M. Dn. Pedro de Marigny, Colonel de milice, decede cet apres midi, a une heure, dans sa maison.

"L'enterrement se fera demain a 7 heures du matin. Son corps sera expose chez Madame Dn. Andres Almonaster.

"Nouvelle Orleans, ce 14 Mai 1800.
"Un de Profundis S. V. P."


37
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42
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STATE HWY NO. 464
6
Bayou
Chinchuba
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45
43
Lewisburg
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46
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12
55
44
38
Castine
T.8S. R.11E.
T.8S. R.12E.
45
48
LAKE
SITE OF MANDEVILLE BOUGHT BY BERNARD MARIGNY.
PART OF FONTAINEBLEAU PLANTATION BOUGHT JUNE 25, 1829
T. 8 S R 11 E.
SEC. 38 - PURCHASED FROM THE HEIRS OF MORGAN EDWARDS, JAN. 22, 1829
46 - PURCHASED FROM THE WIDOW OF ZACHARIAH FAIRCLOTH, JULY 12, 1830. FOR $3,200.
47 - PURCHASED FROM WILLIAM BOWMAN, NOV. 17, 1829, FOR $1,200.
48 - PURCHASED FROM THE HEIRS OF THOMAS SPELL, SEPT. 5, 1831, FOR $1,620.
49 - PURCHASED FROM HEIRS OF SAMUEL SMITH, DEC. 24, 1830, FOR $1,600.
50 - PURCHASED FROM HEIRS OF MORGAN EDWARDS, JAN. 22, 1829.
51 - PURCHASED FROM HEIRS OF MORGAN EDWARDS, JAN. 22, 1829.
SECTIONS 38, 50 & 51 OF R. 11, AND SECTIONS 45 & 46 OF R. 12 WERE BOUGHT FOR $4,000
T. 8 S R 12 E
SEC. 45 - PURCHASED FROM HEIRS OF MORGAN EDWARDS, JAN 22, 1829.
46 - PURCHASED FROM HEIRS OF MORGAN EDWARDS, JAN. 22, 1829.
TOTAL COST OF ABOVE PROPERTY - $11,600. OR $4.06 (APPROX) PER ACRE.
TOTAL ACREAGE IN ABOVE PROPERTY - 2,856.4 (BASED ON SURVEY APPROVED 8/12/1852).
50
U.S. HWY NO 190
51
Bayou
G.M. & N. RR.
46
47
Mandeville
Bayou
52
PONTCHARTRAIN
N
37
53
BEACH DEVELOPMENT AT TCHEFUNCTE STATE PARK. BATH-HOUSE NOW UNDER CONSTRUCTION.
42
54
Green Pt.
J L LALAJR

■ **Map showing site of Mandeville bought by Bernard Marigny in 1829-1831.**

There is nothing in the funeral notice to indicate that Pierre de Marigny died at Fontainebleau. He died so it says "*dans sa maison*". The home referred to must have been that near the fortifications of the city. Furthermore Antonio Bonnabel had through decrees of 1790, 1797, and 1798 and grant of 1799 become owner of the land later known as Fontainebleau.

Cruzat[33] says that "Pierre Philippe de Marigny died at his country home, May 14, 1800" and this may account for the perpetuation of the story that he died at Fontainebleau. Laussat in 1803 visited Bernard Marigny's home and says[34] "Our habitat being near the gates, and thirty paces remote from the ramparts is always called "out of town" (*hors de ville*). So, if "out of town" it was in the country and would be referred to as "his country home." But Cruzat also says[35] "among the estates left by his father, Mr. Marigny owned the charming property of Fontainebleau near Mandeville."

King further says of Marigny:[36]

> His second marriage not proving a happy one, he passed more and more of his time at his father's old summer home of Fontainebleau, on the northern shore of Lake Pontchartrain, not for the sake of the seclusion and quiet it offered after the excitement of American politics and financial speculations, but for the greater liberty it granted for the enjoyment of his favorite pleasures—the table and convivial intercourses with friends. Here it is that his standards of both enjoyments attained a height of perfection that has resulted in his gastronomic apotheosis in Louisiana's traditions and romance.
>
> He it was who, during the early years of the century, conceived the idea of purchasing land along the lake shore and forest adjoining Fontainebleau until sufficient had been acquired for his purpose. He was inspired to make a town as poets are inspired to make a poem. He gave himself over, as a poet should, to his muse, and she, as a muse should, confided herself to him. Nature and art lent themselves kindly to the enterprise. Streets were made, trees were planted, lots were placed on sale, with an eye fixed rather to avoid undesirable additions to the community, than to secure financial profits. Public buildings were provided for, bridges built, a church and a market hall duly erected. Above all, a town government was instituted that eliminated, as far as mere human supervision could, the corrupting influence of American elections. In short, such as the little French town is to-day refined, elegant, yet simple—it left Bernard de Marigny's hand in 1830.

Tinker[37] says that Louis Philippe, and his entourage, were entertained at "Fontainebleau, beautiful plantation at Mandeville [which was not established until 36 years later] on the other side of the Lake". He also mentions "visits made by de Laussat in 1803 at Fontainebleau. . . . ."[38] Again, speaking of the time just after The War of 1812 he says:[39] "Louisiana soon took to her natural life and Marigny was pursuing pacific designs. He was improving his Fontainebleau Plantation and to call his slaves to labor ordered the biggest bell which the State had ever known", [of the bell, more later].

These quotations, which would try to establish a greater antiquity for Fontainebleau than is actually true, could be multiplied indefinitely, but the ones given are typical of the legends, but too firmly implanted in "The Public Mind".

On November 17, Bernard Marigny "of this city" (New Orleans) bought the property described below from William Boman.[40]

All that certain part or parcel of land situated in the . . . . . Parish of St. Tammany measuring ten arpents front on Lake Pontchartrain (between Bayou Tchefuncta & Castin) by forty arpans deep be the same more or less, bounded on the west by land belonging to Joseph Letchworth, and on the east by land belonging to the heirs of Thomas Spell, being the same which the said William Bowman acquired by purchase from the heirs of the late Jacob Bartle . . . . . [on December 20, 1826].

This property (now Section 47, T.8S. R.11E. of the Greensburg District) was later subdivided and became part of the town of Mandeville. The purchase price was $1,200 payable one-half cash and the balance secured by a note for twelve months.

[To Be Continued.]

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[1] Now in possession of and reproduced through the courtesy of Eunice Bonnot, New Orleans. The coat of arms forms part of a pin or medal to be attached to a coat or sash. It was given to her by her grandmother Alice Elmina de Marigny. Eunice Bonnot married Theodule Verret son of Honore Amable Verret and Louise Smith of Mandeville. This branch of the Verret family can undoubtedly be traced back to the stock from which Marie Verret (who married Evan Jones and died in 1804) came. Marie Verret was the mother of Mary Ann Jones who was the first wife of Bernard Marigny. Cruzat, *Loc. cit.*, 42 says "'The Philippe De Marigny family bear for arms 'd'azur au chevron d'or acompagné en chef d'un croissant d'argent à dextre, et d'une etoile de même à sénestre, et en pointe d'un cyne aussi d'argent' ". [An azure field with a gold chevron, accompanied chiefly by a silver crescent on the right and a star of the same on the left, and at the point a swan also of silver.]

[2] The writer wishes to acknowledge the courtesies extended by the officials of The Howard Memorial Library, The New Orleans Public Library, The Louisiana State Library, The Louisiana State Museum Library, The Cabildo, The Federal Writers' Project, of Louisiana, The Federal Survey of Archives, The Notarial Archives, and the Bureau of Archives, St. Louis Cathedral, New Orleans, Louisiana.

[3] Attention is called to the following errors which appear in Part II in the Winter Number. Page 50, Column 2, Line 7, change "Grandes" to "Grande". Page 50, Column 3, 9th line from the bottom change "has" to "had". Page 51, Column 1, Note 14, Line 5, change "9 days" to "11 days."

[4] *Courrier of Louisiana*, July 5th, 1814, Page 3, Column 1.

[5] *Journal de la Chambre des Représentans, La Première Session de la Seconde Législature de L'État de la Louisiane*, 3 and 139.

[6] Now in possession of Mr. James Louis Bonnot, of New Orleans, and reproduced through his courtesy. Mr. Bonnot is the son of Raoul Gabriel Bonnot (B: 1859-D: October 29, 1912) and Henriette Elmina Alice de Marigny (B: February 21, 1859-D: April 27, 1937). Alice de Marigny was the daughter of Gustave Philippe de Marigny (B: July 20, 1827-D: December 5, 1888) and Elmina Bienuem (B: 1830-D: November 14, 1902). Gustave de Marigny was the son of Prosper Francois de Marigny de Mandeville (B: March 6, 1806-D: October 26, 1835) and Marie Celeste D'Estrehan (B: 1808-D: 1885). Prosper Francois, was the son of Bernard Xavier de Marigny de Mandeville (B: October 28, 1785-D: February 3, 1868) and Mary Anne Jones (B: 1782 or 1783-D: June 4, 1808). Thus Mr. Bonnot is the great, great grandson of Bernard Marigny. The picture shows a pair of candlesticks of blue and white china, a jewel box also of blue and white china with silver legs and trim, and a small glass goblet.

[7] *The Courrier of Louisiana*, October 7, 1814, Page 3, Column 1.

[8] *Journal de la Chambre des Représentans, Pendant le Première Session de la Seconde Législature de L'État de la Louisiane.* 9.

[9] *Journal du Sénate, Presidant la Première Session de la Seconde Législature de L'État de la Louisiane*, 9.

[10] Reid, John and Eaton, John Henry. *The Life of General Jackson*, (1817) Page 322 N. B.

[11] Note 8. This translation is from that by Grace King in *The Louisiana Historical Quarterly*, 6, 1923, 61-85.

[12] This pamphlet was privately printed in French. I quote from an English translation at Howard Memorial Library, New Orleans, Page 1-2.

[13] *The Courrier of Louisiana*, December 29, 1815, Page 3, Column 5.

[14] *Bureau of Vital Statistics*, New Orleans, Book 5, Page 37.

[15] *Bureau of Archives*, St. Louis Cathedral, New Orleans, *Register of Baptisms, Act. No. 1146, Volume 3*, Page 265.

[16] *Journal of the Senate*, Second Session, 5th Legislature, State of Louisiana, New Orleans, 1822, Page 3.

[17] *Ibid.*, Page 57.

[18] *Ibid.*, Page 59.

[19] *Ibid.*, Page 67-68.

[20] Fortier, *Op. cit.*, *3*, 200.

[21] *The Courrier of Louisiana*, January 18, 1828, Page 2, Column 2; January 2, 1828, Page 3, Column 4; January 7, 1828, Page 1, Columns 2 and 5.

[22] *Ibid.*, March 24, 1828, Page 1, Column 1; June 20, 1828, Page 1, Column 1.

[23] Fortier, *Op. cit.*, *3*, 201.

[24] *Notarial Archives*, New Orleans, Felix de Armas, Notary, March 4, 1834, Document 84, Deposit of Document by Bernard Marigny. See also Carlisle Pollock, Notary, January 22, 1829, Book 949, Page 33.

[25] *Notarial Archives*, New Orleans, Felix de Armas, Notary, June 15, 1829, Document 772. See Map in Part II, Page 48, Winter Number for Trudeau Survey of 1799.

[26] *Notarial Archives*. New Orleans, Felix de Armas, Notary, June 25, 1829 Document 771. See also Document 533, same Notary, October 9, 1834, for Ratification of this sale by J. L. Rabaud, upon reaching his majority, and Document 531 (same Notary, and same day) for Rabaud's Discharge to Marcelin Bonnabel, (his curator) for the amount due him from this sale.

[27] See description of Fontainebleau Plantation, in mortgage to Citizen's Bank of Louisiana by Bernard Marigny and wife. *Notorial Archives*, New Orleans, Theodore Seghers, Notary, May 12, 1837, Document 235, also in Act of Sale by Marigny in 1852 to H. Griffon. *Notarial Archives*, New Orleans, Adolphe Boudousquie, Notary, February 23, 1852. Book No. 3105, Document 37. See Map on Page 49, Winter Number for limits of Fontainebleau Plantation.

[28] Arthur and de Kernion, *Op. cit.*, 319.

[29] *The Times-Picayune*, New Orleans, Section Two, Page 11, Columns 2 and 3. "States Major Park Grows out of de Marigny Tract", no Byline. See Part I. Autumn Number Page 57, Column 1, 1798 for reference to the entertainment of the Duke of Orleans.

[30] *The Times-Picayune-New Orleans States*, October 9, 1938 "Expressing the Public Mind", Section 2, Page 6, Column 6 and 7. Letter signed, Marie Cruzat de Verges.

[31] *The Times-Picayune New Orleans States*, October 25, 1938. "Expressing The Public Mind", Section 1, Page 8, Column 6. Letter signed Stanley C. Arthur.

[32] King, *Op. cit.*, 18-21.

[33] Cruzat, *Op. cit.*, 45.

[34] See Part II, Page 50, Column 1.

[35] Cruzat, *Op. cit.*, 45.

[36] King, *Op. cit.*, 35 and 37. As shown in this paper Marigny bought the site of Mandeville in 1829-1831 and sold most of the lots in 1834.

[37] Tinker, *Op. cit.*, 301.

[38] *Ibid.*, 303.

[39] *Ibid.*, 312.

[40] *Notarial Archives*, New Orleans, Hugh K. Gordon, Notary, November 17, 1829. Document 940. The act before Gordon "was signed by all the parties and witnesses, excepting the Notary" who died sometime between November 17, 1829 and February 4, 1830. On the latter date the same act was notarized by Hugh Pedesclaux, Notary, Book No. 3389, Page 106. No Document Number. See *Deposit of Documents*, by B. Marigny, September 1, 1834 with Felix de Armas, Notary, Document 483. Boman signs his name thus, but it is usually spelled Bowman. This *Deposit of Document* gives the date of the sale of the property by the heirs of Jacob Bartle (also spelled Bertell) to Bowman.

LOUISIANA'S PRODUCTION OF MINERALS FOR 1938

			TOTALS
CRUDE OIL	North La.	27,934,151	
	South La.	66.434.378	94,368,529 Bbls.
GASOLINE EXTRACTED FROM NATURAL GAS (42 Gallons to Barrel)			2,319,048 Bbls.
NATURAL GAS	North La.	253,146,494,000	
	South La.	6.799.109.000	259,945,603,000 Cu. Ft.
CASINGHEAD GAS	North La.	43,442,466,000	
	South La.	57,106,405,000	100,548,871,000 Cu. Ft.
CARBON BLACK MANUFACTURED FROM NATURAL GAS			34,485,509 Pounds
SULPHUR			328,405 L. Tons
SALT	North La.	83,326	
	South La.	476,420	559,746 Tons
BRINE IN SOLUTION	South La., Only		437,287 Tons

◆

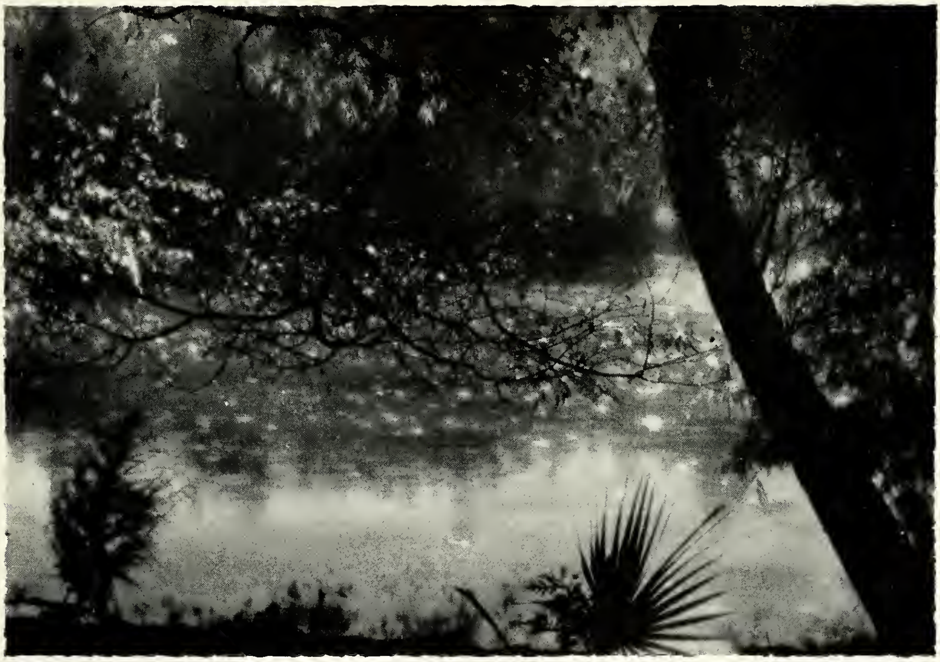
"The ladder of life is full of splinters, but they always prick the hardest when we're sliding down." —Brownell.

◆

Because the crayfish is in a hurry to get its food down, it swallows whole everything it eats. That does not mean that it suffers with indigestion as its stomach is equipped with an excellent set of teeth and all food is thoroughly masticated before it can pass on.

Lovely Louisiana

PHOTOGRAPHIC STUDIES BY DELCROIX



Springtime burgeons here beside this haunted pool of dreams, which weaves its spell of enchantment through lowering boughs and blossoms . . . . . and the poignant smell of honeysuckle from the nearby woodland ravine . . . . .

Lovely Louisiana

BOGUE FALAYA . . . . .

. . . . . sunlight drifting through foliage which stirs gently in the breeze . . . . . dancing in grotesque pattern of shadows about this enchanted stream, blue skies and white sand beaches reflected in shining waters . . . . . invitation to hours of serene meditation . . . . .

. . . . . to every urbanite who was once a country boy or girl there is a nostalgia of yearning about these Louisiana country roads so often encountered off the main highways . . . . . no "step on the gas" here, but peaceful sounds that suggest the eternity and inexorable processes of Nature.

COUNTRY ROAD . . . . .

Lovely Louisiana

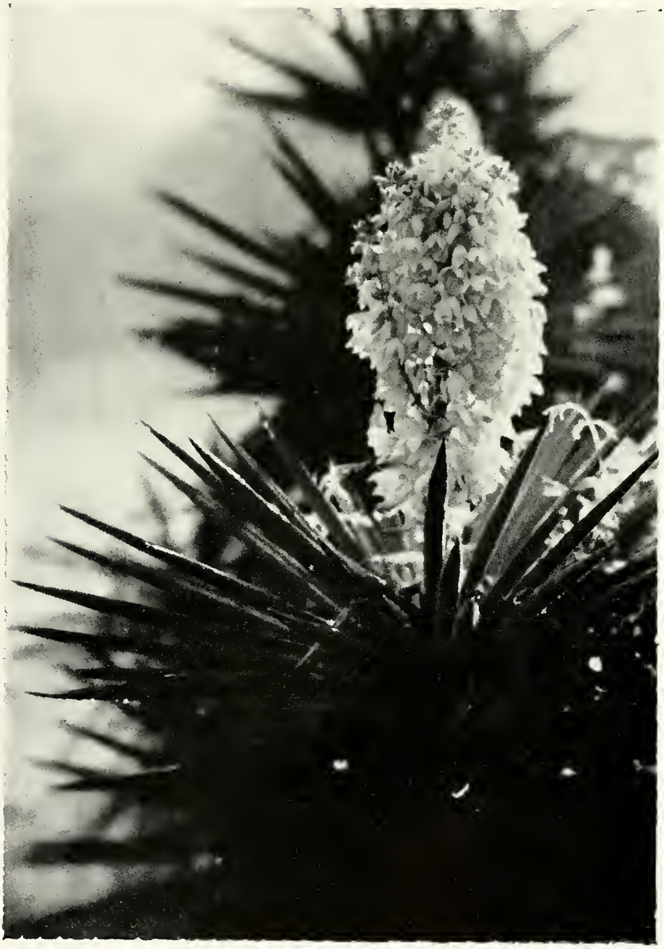
The snowy springtime banks of Dogwood blossoms provide the only snow drifts New Orleans ever sees.

Lovely Louisiana

The simple blossoms of the Wild Hibiscus adorning the banks of Louisiana bayous recall the atmosphere of many a tropical romance.

Lovely Louisiana

The Water Hyacinth is an introduced stranger whose fragile and orchid-like beauty in some measure compensates for the multitude of troubles that it brings to boatmen.



Guarded by a hundred keenest bayonets, the pale and slender beauty of the Yucca blossoms gained from early missionaries the lovely designation of the "Candles of God."

Lovely Louisiana

Against the somber green of subtropical palmettos there has drifted a delicate and orchidaceous fringe, the frail blossoms of the Water Hyacinth.

Investigation of Ground-Water Supplies in Louisiana*

By
V. T. Stringfield and J. C. Maher
Geological Survey, United States Department of the Interior

The economic development of an entire region is often dependent upon the adequacy of the water supplies that can be developed from wells. In the selection of an industrial site, such as one suitable for a paper mill, one of the prime requisites is an ample supply of water sufficient to meet the demands of the future as well as the present.

The use of water supplies from wells throughout Louisiana emphasizes the fact that ground water is one of the valuable natural resources of the State. According to data compiled by the Louisiana Department of Health, about 173 communities in the State have public water supplies and 148 of these obtain their water from wells. Among the largest industrial consumers of ground water are the paper pulp plants, several of which are located in Louisiana.

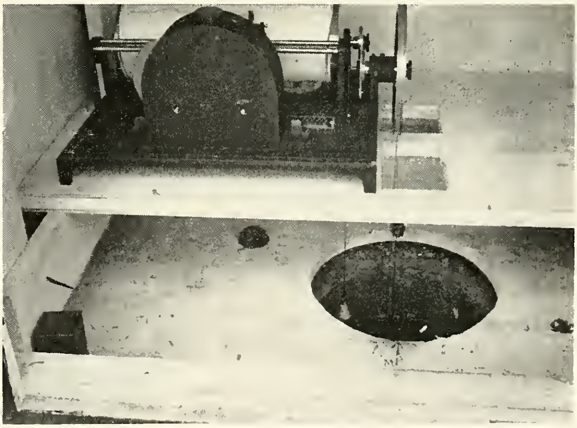
Large quantities of water from wells are used to irrigate crops—chiefly rice—in southern Louisiana. According to the 1930 Census, Louisiana exceeds all other States, except California, in the total area irrigated with water from wells. The Census indicates that in 1929, wells were the source of irrigation for 175,787 acres in Louisiana, or 39 percent of the total area irrigated. It is estimated in a more recent report[1] that nearly 214,000 acres were irrigated with water from wells in 1937.

With reference to the water required in the culture of rice, Mr. Jenkins states, "A depth of approximately 6 inches of water must be maintained throughout a period of at least 75 days. Water, therefore, is required in large quantities and must be available at all times during the growing season to insure maximum production. In Louisiana the rainfall during the growing season furnishes about 20 acre-inches, and the remaining 28 inches of the 4 acre-feet of irrigation water usually considered necessary are obtained by pumping." According to these estimates a quantity of approximately 500,000 acre-feet of water was obtained from wells during the irrigation season in 1937. This is a quantity sufficient to supply throughout the year about 4½ million people (more than twice the population of Louisiana in 1930) with a per capita consumption of 100 gallons a day. In addition to the acreage irrigated entirely by wells, some of the area normally supplied with water from surface sources is irrigated by wells when the surface water is low and salt water encroachment makes the surface water unsuitable for use.

Most of the area irrigated from wells is in the southwest part of the State. However, part of it is in the Florida parishes, chiefly Tangipahoa Parish, which was reported to have more wells in use for irrigation than any other parish in the State at the time of the 1930 Census, even though the total area irrigated by wells, 29,629 acres, was somewhat less than that in a number of the parishes in the southwest part of the State.

Many of the supplies of ground water appear adequate for the present requirements but some of them present major problems relating both to the quantity and quality of the water, including the following: (1) decline of water levels and yield of wells in areas of large draft from wells; (2) contamination of fresh ground water by salt water; (3) occurrence of ground water containing objectionable amounts of fluoride; (4) location of new supplies to replace the depleted or contaminated supplies, and location of supplies for new developments.

Very little has been published on the ground-water resources of Louisiana since the reports by Harris, Fuller, and Veatch[2] more than a quarter of a century ago. In view of the value of the ground-water resources of Louisiana and the urgent need for additional information concerning these resources, the Department of Conservation of Louisiana entered into an agreement with the Geological Survey, United States Department of the Interior, in December 1937 providing for a cooperative investigation of the ground-water resources of the State by the Federal and State Geological Surveys. As indicated on page 133 of the 13th Biennial Report of the Department of Conservation of Louisiana, plans have been made, "to conduct ground-water investigations throughout the State on a continuing cooperative basis until the entire State has been covered in a systematic manner, and to undertake, first, the investigations in those areas in which



■ **Fig. 1. Water level recorder installed on an observation well.**

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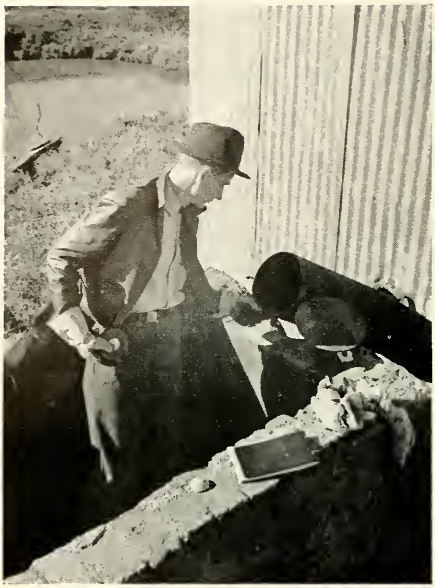
* Published by permission of the Director, Geological Survey, United States Department of the Interior.



■ **Fig. 2. Measurement with a steel tape the depth to water in an observation well.**

ground-water problems are pressing for immediate solution, or in which it is anticipated there may be, in the near future, a considerable development requiring ground-water supplies. Continuing investigations of this type are regularly a part of the work of the United States Geological Survey and the various State Geological Surveys, and such studies have been in progress in other States for a number of years. The proposed program is in accord with the general plan of operation of the Louisiana Department of Conservation in its program of conserving and developing the natural resources of Louisiana." Under the provisions of this cooperative agreement, field work on the ground-water survey was started in May 1938 in Rapides Parish and it has been extended into Grant, Avoyelles, Jefferson Davis, and Acadia Parishes. Observations will be started in the near future in St. Tammany and Tangipahoa Parishes with reference to the artesian water available in that area.

RAPIDES PARISH

In Rapides Parish, which was selected as the area in which to begin the work, the water levels in wells penetrating the water-bearing sands that furnish the public supply of Alexandria have declined from a few feet above the surface of the ground to as much as 100 feet below the surface. Also in some parts of the area the water is too highly mineralized to be satisfactory for domestic or public consumption.

The field work on the areal survey in the parish has been completed and a report on the ground-water resources is in preparation. However, observations on the water levels in wells are being continued to obtain additional information concerning the extent to which the ground-water supply is being depleted by withdrawal of water from wells and the extent it is being replenished by rainfall. Records of the changes in the water levels of the ground-water reservoirs constitute an essential part of this type of investigation. Therefore, instruments that give a continuous graphic record of the fluctuations of water in a well have been installed on four wells in Alexandria and vicinity. One of these recorders is illustrated in figure 1.

Individual measurements to determine the depth to the water surface in a well are often simply but accurately made with a steel tape as indicated in figure 2. On flowing artesian wells in which the water will rise not more than about 6 feet above the surface, measurements of the static head are made by attaching a garden hose to the well and measuring the height at which the water stands in the hose. On wells in which the water will rise more than 6 feet above the surface the static head is determined by attaching a pressure gage to the well, as illustrated in figure 3. These observations show fluctuation due to several different causes. Among the smallest of these recorded in the area are fluctuations caused by changes in atmospheric pressure. Such fluctuations, although small, reveal important information concerning the occurrence of the water and the water-bearing formations.

In general the ground water supplies of this parish have been developed from sands of Miocene age and younger materials overlying the Miocene. Water from the Miocene is obtained from depths of 150 to 1200 feet while the younger materials furnish water at depths varying from a few feet to about 150 feet.

FORMATIONS OVERLYING THE MIOCENE

The materials overlying the Miocene consisting of alternating sands, gravels, and clays were regarded by Veatch[3] as Recent, Pleistocene, and Pliocene in age. However Chawner[4] and Fisk[5] in recent studies of these sediments in adjacent parishes consider the deposits formerly termed Pliocene (Lafayette of Hilgard[6] or Citronelle of Matson[7]) as older Pleistocene and the materials formerly termed Pleistocene (Port Hudson) as younger Pleistocene.

The youngest sediments overlying the Miocene (including the Recent and Pleistocene of Veatch) are present at or near the surface in the low lands along the rivers and furnish large quantities of hard water with varying amounts of chloride and iron. In some areas, such as Catahoula Lake, the mineralization is large enough to render the water unsatisfactory for domestic or public consumption. Chemical analyses of the water of these formations indicate that the hardness ranges from about 50 parts per million to over 2300 parts per million while the chloride content ranges from about 4 parts per million to over 2300 parts per million.

The older sediments overlying the Miocene (including the Pliocene of Veatch) occupy the higher levels and contain comparatively soft water with low chloride content. The quantity of this water available, of course, varies with the locality but seems to be adequate for domestic and livestock purposes. The city of Glenmora has developed an entirely satisfactory supply from this source, using approximately 100,000 gallons daily.

MIOCENE

Miocene sediments underlie the more unconsolidated materials in all parts of the parish. The Catahoula sandstone, which is considered as lower Miocene,[8] outcrops in central and northern Rapides Parish, forming the topographic feature known as the Kisatchie Wold.

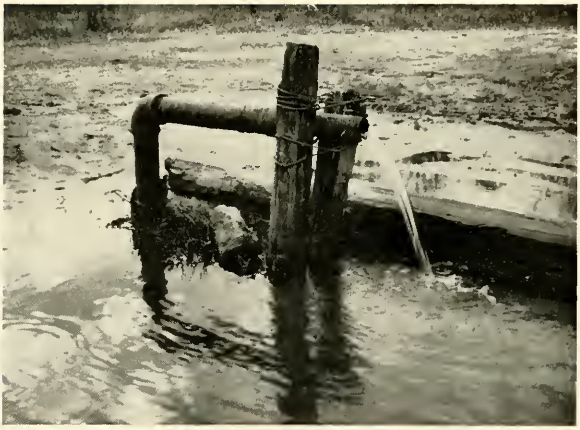
The Miocene formations dip southeast toward the Gulf of Mexico at a rate of 50 to 100 feet per mile; the dip increasing with depth in the section as might be expected of deltaic sediments in a region of subsidence.[9] However, by comparison of the stratigraphic sequence, hydrostatic pressures of the artesian water, and the quality of the water, a reversal of dip is apparent which forms a synclinal trough along Bayou Rapides and the Red River from a considerable distance above Zimmerman to at least as far southeast as Lecompte. The exact extent of this feature has not been determined as yet.

This structure is responsible for the hydraulic conditions giving the numerous flowing wells along Bayou Rapides. The strongest pressures of these artesian wells occur near the junction of the surrounding hill land, composed mainly of Miocene materials, and the low bottom land. These hills serve as a catchment basin for this artesian system, as evidenced by the diminishing pressures away from the hills.

The Miocene sands furnish municipal supplies for Boyce, Alexandria, Pineville, Lecompte, and Cheneyville, whose total daily pumpage approximates 3¼ million gallons daily. The water is soft and usually has a low chloride content. A few Miocene aquifers supply water containing over 700 parts per million of bicarbonate. A small amount of fluoride has been found in most of the water from Miocene horizons, but this amount is generally within the limits set by the U. S. Public Health Service. The detrimental effect of water containing large quantities of fluoride is discussed briefly in connection with Avoyelles Parish in this article.

GRANT PARISH

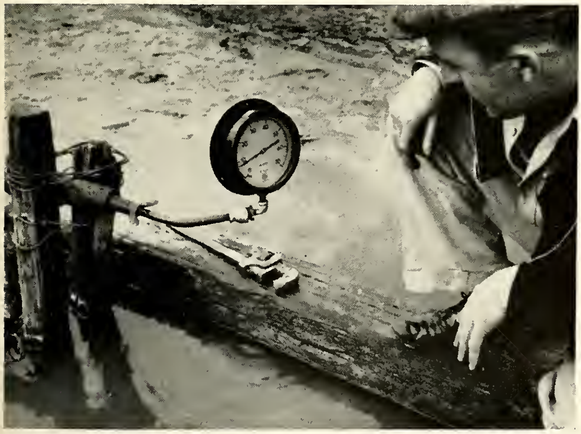
In Grant Parish the ground-water problem is in large part qualitative. The ground water in part of the area is too highly mineralized to be suitable for domestic consumption and the public supply of Colfax is not entirely satisfactory. Many of the domestic supplies are obtained from cisterns. However, in some parts of the parish satisfactory ground-water supplies can be obtained. The work commenced in Grant Parish will be continued next spring and a report will be prepared at the end of the field season.



■ Fig. 3. (A). Observation well on which gage is used to determine the shut-in pressure.

AVOYELLES PARISH

Ground water with objectionable amounts of fluoride was reported at Bunkie, and the ground-water survey was extended into Avoyelles Parish as soon as practicable in order to obtain information concerning the occurrence of the fluoride water. Fluoride in water used for drinking or cooking is associated with mottled enamel of the teeth which is made apparent by dull, chalky-brown enamel, brown stains and pitting of the enamel. As indicated by Dean and Elvove,[10] "the only portion of the population known to need protection from the dental standpoint is the group between birth and 8 years of age inclusive. This interval in time is sufficient to cover the period of calcification of the crowns of all of the permanent teeth with the exception of the third molars. However, the mottling acquired is permanent."



■ Fig. 3. (B). Observation well with pressure gage attached to determine the shut-in pressure.

According to Dean[11] with "continuous use of water containing about 1 part per million (of fluoride), it is probable that the very mildest forms of mottled enamel may develop in about 10 percent of the group. In waters containing 1.7 to 1.8 parts per million, the incidence may be expected to rise to 40 or 50 percent, although the percentage distribution of severity would be largely of the "very mild" and "mild" types. At 2.5 parts per million an incidence of about 75 to 80 percent might be expected, with possibly 20 to 25 percent of all cases falling into the "moderate" or a severer type.

"At 4 parts per million the incidence is, in general, in the neighborhood of 90 percent, and as a rule 35 percent or more of the children are generally classified as moderate or worse. In concentrations of 6 parts per million or higher an incidence of 100 percent is not unusual."

In connection with the fluoride problem, samples of water from about 70 wells in Avoyelles and Rapides Parishes were examined by Margaret D. Foster in the Water Resources Laboratory of the Federal Survey. Samples from wells penetrating the principal water-bearing sands contained as much as 6.6 parts per million in Bunkie, 5.4 parts per million near Cheneyville, 2.4 parts per million at Poland School, 2.2 parts per million at Rapides School, and 1.8 parts per million at Alexandria. However, samples of the hard water from the shallow wells contained little or no fluoride though an excessive amount of iron was present. The municipal usage of this water would require treatment for the removal of the calcium and magnesium salts which cause the hardness, along with the iron content which is objectionable. The Louisiana Ice and Electric Company is using a treatment of this type at present to utilize the hard low-chloride water for ice-making purposes at Bunkie.

The analyses also indicate that natural softening of water occurs in the principal water-bearing sands which yield water to most of the deeper wells. Natural softening of ground water has been reported[12] in several parts of the Atlantic and the Gulf Coastal Plain.

JEFFERSON DAVIS AND ACADIA PARISHES

The ground-water survey was extended into Jefferson Davis and Acadia Parishes because large quantities of water from wells are being used for irrigation of rice. Although the water-bearing formations are very productive, the water levels in some of these wells have declined considerably in the past 30 years.

A gradual decline in the water levels over a period of years is indicated by various statements of land-owners in regard to the necessity to lower the pumps in the wells. Mr. Henry Houssiere of Jennings, Louisiana reported the following pump settings in one of the wells near Roanoke:—

1908	Pump set in wooden pit at 35 feet. Water level remained above the pump during the entire season.
1914	Pump reset in steel pit at 59 feet. Water level remained above the pump during the entire season.
1931	Water level began dropping below the pump setting in the middle of the season.
1938	Pumps on new installations in this area are being set at depth of 80 feet.

This 45-foot lowering of pumps in the past 30 years indicates a significant decline of water levels. However, it should be understood that a certain amount of lowering of the water levels is always produced when water is withdrawn through wells. It is only by critical study of adequate records of water levels and pumpage, in the light of the geological and hydrological conditions of an area, that it is possible to determine the quantity of water which is perennially available in that area. Field investigations will continue in these parishes during the winter.

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Confiscation of Property Title

[Continued from Page 19]

To deprive the people of our coastal states of these benefits would certainly appear to be an unfair act of discrimination in favor of the people of our interior States, but if the principle of "confiscation" through alleged property title were once established there would be no end to it and no section of our country or individual State might hope to escape its devastating blight. Indeed, it would be a very definite step in the direction of those dictatorial and confiscatory measures which we as a nation condemn in certain other nations.

Just at this time our oil companies are seeking an adjustment of their claims against the Mexican government for the expropriation of their properties. I dare say that our own government is in sympathy with the efforts of a group of our citizens to salvage some of their losses, but its attention may well be directed to the mote that now threatens its own eye.

I might add that I am in sympathy with the apparent objective of the Navy Department, which is to prevent the further depletion of the California petroleum reserves and insure a stock of oil against the contingency of war. But the end does not always justify the means. There would be fully as much justice in the seizure of the United States Steel Corporation and all of its assets, at a sacrifice of the stockholders, because of the vital importance of steel as an instrument of war.

I do not say that such confiscation would not be justified as a war expedient, or that it would not be justified as part of a government program of national defense, but in any event the rights of the individual and of the States should be recognized.

If we are to have expropriation, or confiscation, it should be recognized as such, with whatever compensatory measures that may duly be established in law and equity, and not come in the guise of a judicial act to establish the proprietory interest of the Federal government at the expense of a partial or segregated section of its own people.

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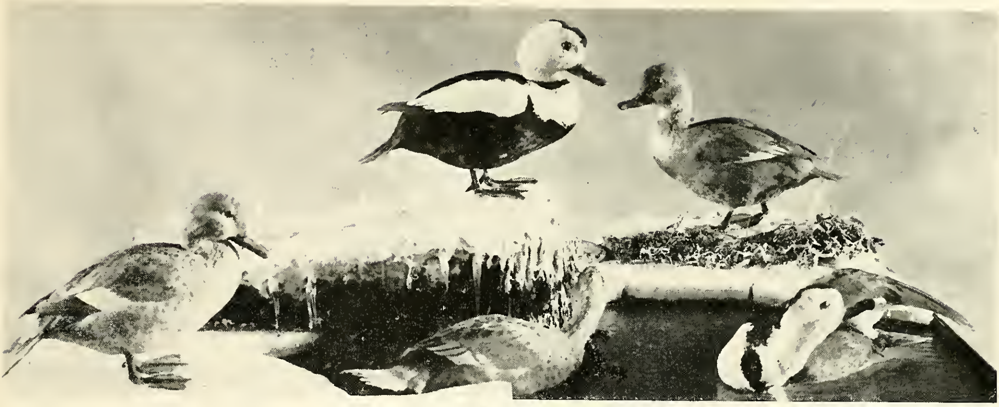
The Weather

[Continued from Page 20]

by radiation in urban and rural areas. This variation in relative loss of heat explains why the countryside is generally cooler at night than the city streets.

The air that is cooled by means of radiation becomes more dense and tends to settle at lowest elevations. In flat country there is not sufficient gradient of land surface to enable the cold heavy air to flow; therefore, it merely settles as a blanket over the land surface, becoming thicker and colder with continued radiation. However, in an area of appreciable topographic relief, the cooled air flows off the hilltops and fills the valleys by displacement of the warmer, lighter air. Everyone, while riding along a hilly road at night, has experienced the results of this phenomenon, having found the air in the valleys colder than that on top of the hills.

Radiation of heat from the earth and the effect on the atmosphere results in an "air conditioning" process that becomes an integral part of our daily weather . . . . and as Mark Twain so aptly remarked, "Everyone talks about the weather, but nobody does anything about it!"



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THE LABRADOR DUCK. A fine habitat group shows admirably the appearance of this extinct waterfowl.

Vanished Americans

By
James Nelson Gowanloch

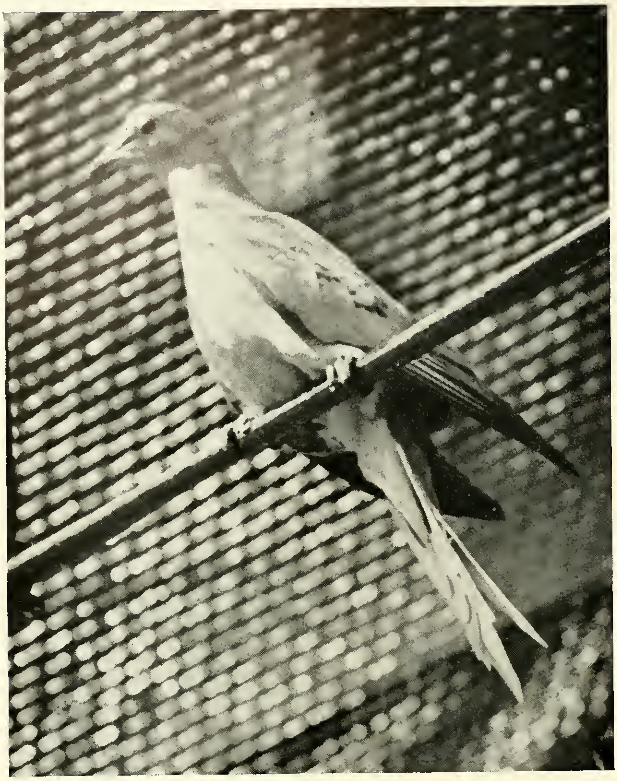
The torrent of Man's movements over the face of the earth, the impact of Man's influence upon other forms of life, these constitute an essentially significant, ever interesting register of what little we really do know of the history of our world. The "drums and tramplings" of armies have destroyed cities and extinguished empires. Yet even, as in the fields of Flanders where the song of the skylark could still be heard above the concussion of high explosives, certain major human conflicts appear superficially at least to have shaken little, if at all, the stability of the broad complex we call nature. The "superficially" must be emphasized for there is no doubt that Man has wrought profound changes, sometimes beneficial, sometimes disastrous, in the great and ever enchanting picture of Nature. The furious attrition of nation against nation, with our present deadly instruments of warfare, can last at most but for a matter of years. Contrastingly, Man's warfare against Nature, calling for no national rearmament program, no vast mass assaults, but resolving itself into a summation of individual and invidious attacks, can and have spelled death for certain species of the world's fauna.

It is the purpose of the present article briefly to discuss some vanished Americans, bird Americans in this case, birds that are gone forever. Also will be referred to other species that although still surviving, have come perilously near to extinction. Some of these birds are Louisiana species whose numbers could once be described only as astounding. Some never did occur in Louisiana but with our other North American birds were once part of the great heritage of wildlife that white men found on this continent. Now, in large part, and in some instances wholly, through the influence of those white men, these species are blotted forever from the world of life.

The original Americans, the Indians, were natural conservationists. The field and the forest, not the delicatessen and the chain store, furnished their daily bread. It was to fill the dinner pot and not to beat the bag limit that they did their hunting. Their livestock was the wild inhabitants of their environment. They killed to eat in such fashion that they could still kill to eat again tomorrow. The advent of the white man in North America set loose a flood of changes whose accelerating pace could not then be predicted, cannot even today, with any measure of accuracy be foretold. Immeasurable virgin lands teeming with game seemed to the European immigrant, whose only hunting experiences had often previously been in the role of poacher on the closely guarded game preserve of some lord, an inexhaustible paradise. Abandoned cruelty was too often characteristic of the white man's hunting in North America. Such ruthless hunting extended even to fellow human beings, as, for example, when white men hunted down and completely exterminated, in historic times, the "Red Indians" of Newfoundland (so called because of their use of red pigments), whom they pursued, utterly harmless natives though they were, just as relentlessly as if they were out for a day of rabbit shooting.

The rich bird life of North America was richer before the white man's work, and is undoubtedly richer today than it will be tomorrow in spite of all possible efforts to arrest the damage that Man does. It is most desirable to survey the story of some of our lost Americans so that some of the lessons of this past may contribute their deplorable conclusions to some of the problems of the future.

The branch of biology which concerns the relation of an organism, plant or animal, to its environment is known technically as ecology, a word derived from the Greek word meaning "a house," and the Greek word, meaning, roughly, "a science," signifying in other words the relations and interactions of a living entity with the circumambient world in which it exists. Ecology is an extremely difficult field of science. It involves biological, physical, meteorological, geological and even astronomical studies. The accurate evaluation of the factors concerned is often impossible. Sometimes an element in the environment, existing in such minute concentration that special microchemical methods are necessary for its detection, becomes the one factor of critical, limiting importance. Sometimes no logical explanation of ecological changes can be found. Thus, for



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■ THE PASSENGER PIGEON. Martha, the last Passenger Pigeon, once solitary survivor of a species whose prodigious flocks darkened the pioneer skies.

example, the Dickcissel, *Spiza americana*, a charming little member of the sparrow family that much resembles a miniature Meadowlark, formerly bred abundantly on the Atlantic coastal plain but for no ascertained reason became, some sixty years ago, rare east of the Alleghenies. Other ecological factors altered with the change and development of Man's civilization in the North American continent. Thus, hoards of Blackbirds crowding to feast on the small fields of the pioneer settlers caused disastrous destruction, but their effect, with the extension of agricultural development, became less and less important and, ultimately, negligible. Also, many species of birds, such as, for example, the Bobwhite, *Colinus virginianus* (three subspecies occur), found more advantageous the borderland environment between forest and agriculture and correspondingly increased in numbers as human settlements expanded.

Returning now to these other forms which have forever disappeared from our American scene we find that similarly the explanation of their decline and extinction is so complicated that seldom can any complete, clear, scientific answer be given. "Why did they become extinct?" The conditions under which they ceased to survive have passed away and are now incapable of reconstruction or satisfactory analysis. Their reactions to the elements of their environment can never be tested. The whole jigsaw puzzle of their interrelations can never be worked out, but it is clear that for some of them Man was the most important, the final and fatal factor in the pattern of their passing. The Passenger Pigeon, the Great Auk and the Labrador Duck are clearly extinct because Man found it desirable and profitable to kill them.

There will now follow some brief, sequential, discussions of those species of American birds that have either completely vanished from the world, or have vanished from North America as existing species or are, in their numbers, so reduced that the delicate balance of their struggle for survival may be sufficiently upset by some brief adverse change so that they are swept to join the sad company of the lost.

THE GREAT AUK

The Great Auk, *Plautus impennis*, was a sea bird about twenty-nine inches long with legs set far back on its body and with wings so small that it could not fly. Once inhabiting the coasts and islands of the North Atlantic from near the Arctic Circle south to Massachusetts and Ireland, and occasionally as far south as Florida, it had the fatal qualities of producing good flesh, good feathers and good oil. Although unrelated to the Penguins (which are exclusively birds of south of the Equator), the Great Auk was, as a matter of fact, the original "penguin," having received this name from the early French voyagers who in their westward wanderings met with and ate this strange fowl. In May 1594, Jacques Cartier describes how at Funk Island off Newfoundland "we filled two boats full of them" in less than half an hour. In spite of vast numbers and huge breeding concentrations, the Auk was not especially prolific, since the female laid but a single egg each year. The Great Auk was piously appreciated by the early white settlers of America, one of whom, in 1622, exclaimed: "God made the innocencie of those poor creatures to become such an admirable instrument for the sustentation of man." Featherbeds were needed against the northern winter cold. The Great Auks provided the feathers for them. Driven into stone corrals, they were held until needed, then treated with boiling water so that their feathers could easily be removed. The French, Portuguese and Spanish codfishermen of the Grand Banks depended much on the Great Auk for meat, killed them with clubs, carried them aboard alive, or actually herded them like droves of cattle into their small shore boats. The eggs gathered for food, the adults eaten fresh, eaten salted or even used for bait, the species could stand no such drain, particularly since the birds were so helpless and stupid that they were much more easily captured than domestic ducks. Fuel was scarce so the Great Auks themselves, rich in fat, were used as fuel to provide the hot water to scald the feathers from their brethern. 1500 A. D. became 1800 A. D., and the Great Auk was gone as a source of flesh, of feathers and of oil. The last sure record is of the capture of two alive southwest of Ireland in 1844. Today in the museums of the world and in private collections there is a total of eighty skins and seventy-five eggs of a once vastly numerous and vastly interesting bird. Great Auk eggs bring as much as $1,575.00 each. Great Auk skins command $3,500.00. A little conservation properly applied, the simple establishment of an adequately administered, even small Great Auk refuge, an idea that then would have been laughed at, could in all probability have kept this vanished American as a permanent and fascinating member of North American wildlife.

THE LABRADOR DUCK

The case of the Labrador Duck, *Camptortynchus labradorius*, also called the Pied Duck (although the latter name is also shared by the Goldeneye) is an unusual one since this species was apparently never within historic times abundant anywhere in its range. Little is known of its life history. The male was a strikingly patterned creature as indicated in the accompanying photograph of a mounted group in the American Museum of Natural History. Audubon himself never did see a living specimen of this bird, although he visited Labrador where it was supposed to breed. Information he includes in his accounts appears to be vague and unreliable.

Allied closely to the Eider Duck, the Labrador Duck evidently bred on rocky islets safe from the attacks of foxes and other mammalian predators. Newton records the raids of Man upon these breeding places for the sake of shooting the birds and gathering their eggs as being the chief factor in their passing. The last Labrador Duck was shot near Long Island, New York, sixty-one years ago. Considerable numbers, mostly females and young males, were reported by Elliott in the New York City markets between 1860 and 1870. The last preserved specimen was shot on Long Island in the autumn of 1875 and was presented to the Smithsonian Institution. Since that time only a single specimen has been reported as taken. Reputed to have been captured near Elmira, New York, in 1878, this duck was eaten before any ornithologist heard about it, and unfortunately the head and neck, then secured and identified, were lost so that the record could not subsequently be verified.

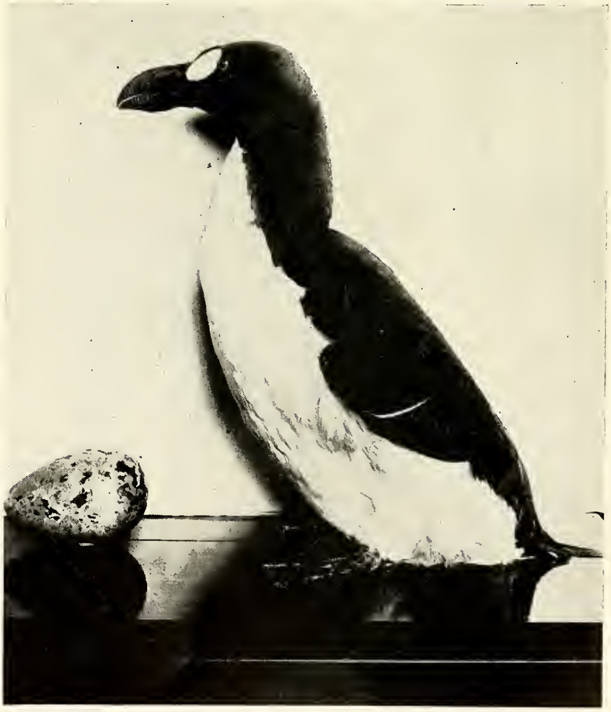
No scientist seems to have realized the fact that this species was nearing extermination and there thus existed the strange picture of the housewife going to the open market in New York City and purchasing for only a few cents a bird which at that very time was on the verge of extinction. Today only some forty-four specimens are known to exist in museums, thirty-one of which are in American collections. Its breeding range will probably remain forever unknown. It seems clearly indicated, however, that this range was restricted and that Man's persecution of the species, including taking of eggs and the killing of the adults during the summer molting season when they were unable to fly, contributed chiefly to its complete disappearance. Today the skin of the bird commands a market value of some $8,000.00.

THE ESKIMO CURLEW

The Eskimo Curlew, *Phaeopus borealis*, presents another problem of extinction to which Man is the chief answer. Closely related to two still surviving species, namely, the Long-billed Curlew, *Numenius americanus americanus*, and the Hudsonian Curlew, *Phaeopus hudsonicus*, the Eskimo Curlew once afforded an amazing picture of abundance. Known also as the Dough Bird, the Eskimo Curlew nested in the Arctic, migrated eastward to Labrador, then habitually flew some two thousand miles over the ocean to South America, down which continent it proceeded to its wintering grounds in Patagonia. Storms often brought it inland along the Atlantic coast as far southward as New Jersey. The plains of Argentina and Patagonia to Chile and occasionally the Falkland Islands were its winter abode. The return journey northward to its summer breeding ground was by way of the Mississippi Valley. The Eskimo Curlew was formerly apparently a common spring migrant during March and April. John James Audubon records seeing flocks of this species on Barataria Bay from April 5 to 10, one hundred and two years ago. It was reported by Beyer as occurring also in the fall. Oberholser has been able to locate only four Louisiana specimens of this bird, all of them now in the Gustave Kohn collection of the Tulane University. These were taken in March and April, 1881, March, 1889, in New Orleans, and the last of all four was taken March 27, 1889, at Rayne, in Acadia parish.

The last North American specimen of this bird was taken at Norfolk, Nebraska, in 1915. The last verified specimen taken was secured in Argentina in 1925.

The Eskimo Curlew, to tell the story bluntly, was simply, cruelly and abominably slaughtered. From 1856 to 1875 Eskimo Curlews appeared in vast flocks in Texas. Records indicate that a party of twenty-five or thirty men killed as many as three thousand of these birds in a single day. Twenty-five were often brought down by the single discharge of an old muzzle-loader. Market hunting was the primary factor in sweeping out of existence this interesting species. Its northern breeding grounds, far removed from Man, remained unchanged and un-



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■ THE GREAT AUK—ADULT AND EGG. **The highly conical shape of the egg prevented it from being blown from rocky ledges by the wind.**

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Copyright. Courtesy of Dr. Alfred Gross.

■ **THE HEATH HEN. Last of its race, this male Heath Hen remained sole known survivor for three and a quarter years.**

disturbed. No sweeping and general meteorological conditions could conceivably have affected this species without also reducing the numbers of other species of shore birds that followed a similar migration course. Ill-equipped in its behavior, the Eskimo Curlew formed compact flocks whose individuals were so unwary and so solicitous of a fallen companion that they would return again and again to the gunner's range of fire. Flocks forming dense masses a hundred yards or more in width and as much as a quarter to a half a mile in length were frequent. Such an aggregation on alighting would cover from forty to fifty acres of ground. It is little wonder that these early hunters thought absurd any suggestion that the Eskimo Curlew would ever become extinct.

THE PASSENGER PIGEON

The story of the Passenger Pigeon, *Ectopistes migratorius*, often told, constitutes one of the most fantastic and darkly tragic chapters in the history of any species of American wild bird. Once living in numbers so enormous that only the integrity of accredited scientific observers makes them believable, the Passenger Pigeon is now forever vanished. The last wild Passenger Pigeon taken in Louisiana is apparently that recorded by Robert Butler, one bird killed near Bains, West Feliciana Parish, some time during the autumn of 1895. The last wild Passenger Pigeon shot in the United States was recorded in April, 1904. The last wild Passenger Pigeon positively identified in life was observed in 1907. The last known Passenger Pigeon, a bird bred in captivity, died in the Cincinnati Zoological Park, September 1, 1914.

The Passenger Pigeon bred formerly from northern Canada south to Kansas, Mississippi, Kentucky, Pennsylvania and New York. It wintered chiefly from Arkansas and North Carolina south to central Texas, Louisiana and Florida.

The early accounts of the movements of the Passenger Pigeon are astounding. Wilson, in 1832, observed one flock in Kentucky which, on what appears to be a fair basis, he calculated to contain the incredible number of 2,230,272,000 individuals. Feeding on mast, this flock alone, supposing that each bird consumed one pint, would require 17,424,000 bushels of mast each day. Traveling along the banks of the Ohio River in 1813, Audubon observed near Louisville flocks of pigeons passing in an undiminished stream for three successive days. The noise of their passing made inaudible even shouted conversation. The torrent of birds alighting in the trees so overloaded the branches that they broke and fell to earth.

One flight was described by French in Pennsylvania for 1866 as occurring from one of the pigeon roosts as follows: "Each morning a valley a mile wide between the hills was filled strata above strata, eight courses deep at times, for about an hour with the multitude of birds flowing westward at the rate of a mile a minute going for food. [Author's Note. This is undoubtedly overestimated since the speed of the Mourning Dove as measured by automobile speedometer over a distance of one mile is known to be only 41 miles an hour.] The roar of wings was like a tornado in the tree tops, and the morning was darkened as by a heavy thundershower."

The Passenger Pigeon was a victim of human greed. Its vast nesting areas were invaded by professional pigeon killers. Wilson, in 1832, describes vividly the destruction of one nesting ground in Kentucky, forty square miles in extent, as follows:

"As soon as the young were fully grown, and before they left the nests, numerous parties of the inhabitants, from all parts of the adjacent country, came with wagons, axes, beds, cooking utensils, many of them accompanied by the greater part of their families, and encamped for several days at this immense nursery. . . . . The ground was strewed with broken limbs of trees, eggs, and squab pigeons, which had been precipitated from above, and on which herds of hogs were fattening. Hawks, buzzards, and eagles were sailing about in great numbers, and seizing the squabs from their nests at pleasure; while from twenty feet upwards to the tops of the trees the view through the woods presented a perpetual tumult of crowding and fluttering multitudes of pigeons, their wings roaring like thunder; mingled with the frequent crash of falling timber; for now the axe-men were at work cutting down those trees that seemed to be most crowded with nests; and contrived to fell them in such a manner that in their descent they might bring down several others; by which means the falling of one large tree sometimes produced two hundred squabs, little inferior in size to the old ones, and almost one mass of fat. . . . It was dangerous to walk under the flying and fluttering millions, from the frequent fall of large branches, broken down by the weight of the multitudes above, and which in their descent often destroyed numbers of the birds themselves".

The improvement of mail and telegraph systems providing a means of rapidly available information for the pigeoners, as they were called, the extension of railways, all these contributed to seal the doom of this beautiful bird. Tons upon tons of dead birds were taken for the market. Thousands upon thousands were captured alive and sold to clubs for trap shooting. The decreasing forests made more concentrated the bird's nesting and more intensified the effects Man wrought upon it.

It was estimated in 1879, that approximately five thousand men practiced pigeonering as a profession. More and more ingenious and destructive methods of trapping the birds were devised. A single trapper was known to have caught and delivered two thousand dozen pigeons in ten days, that is, about two thousand five hundred birds each day. Five thousand birds were recorded as having been taken in a single net in a single day at one of the favorite pigeon resorts. Dead pigeons sold in Chicago markets for fifty to sixty cents a dozen; live birds at $1.00 to $2.00 a dozen. Pigeoners were able to make from $10.00 to $40.00 a day.

The last great nesting of this beautiful species occurred at Petoskey, Michigan, in 1878. Three to ten miles in width, twenty-eight to forty miles in length, this vast nesting place was raided by a large force of Indian men and boys who were paid a cent apiece for the birds. Innumerable individuals were left to decay on the ground. The woods were filled with wounded birds. Young squabs, parentless, were left to starve to death.

By 1910-11-12, it was already too late. Rewards totaling over $1,000.00 were offered for acceptable evidence that a living wild Passenger Pigeon existed. The rewards remained unclaimed. Captive birds, bred by Dr. C. O. Whitman at the University of Chicago, and numbering, in 1903, only a dozen, were descendants of a single pair and had ceased to breed. The last survivor of this group, a bird to whom the name of Martha was given, died of old age in the Cincinnati Zoo in 1914. A picture of this last known living individual, taken by Dr. William C. Herman of Cincinnati, is here reproduced. Martha's skin, carefully stuffed, now rests in the Smithsonian Institution, Washington, D. C.

Bent has well discussed the problem of why even a few members of these prodigious flocks failed to survive and pepetuate, even in meagre numbers, their race:

"The evidence that man is responsible for the enormous destruction is voluminous and convincing, but why, it may be asked, did not a few escape and continue the race when the numbers became so small that the pursuit of the bird was no longer commercially profitable? It is believed by some that the bird still exists in small numbers in remote parts of northern Michigan and in Canada. In answer to this it may be said that a bird accustomed for ages to living together in large numbers and close ranks, whether in feeding, migrating, roosting, or nesting, might find it impossible to continue satisfactorily these functions with greatly reduced and scattered ranks. It is probably no mere figure of speech to say that under these circumstances such a communistic bird would 'lose heart,' nor is it fanciful to suppose that sterility might in consequence affect the remnants. The ease and thoroughness with which the squabs were destroyed, even in preference to the adults, would alone account for the extinction. Just as a forest finally dies of disease, accident, and old age if all the seedlings are destroyed by intensive grazing, so any species of bird is doomed in the same way to extinction if its offspring are annihilated before they reach maturity."

There is no doubt that, had public opinion been educated to some reasonable degree of realization that the doom of this bird was so imminent, and had correspondingly some reasonable measures been attempted to conserve the species, this exquisite bird, one of the most beautiful in the whole North American avifauna, might well have survived. Repeated reports of the finding of wild Passenger Pigeons have been received and investigated by competent scientists. Without exception, all proved to be cases of mistaken identity. The Band-tailed Pigeon, often confused in the west, has a short, square tail, contrasting with the long, pointed tail of the Passenger Pigeon. The Mourning Dove, distributed throughout much of the continent, is a smaller bird. The chief differences that mark off the Passenger Pigeon from the Mourning Dove are its larger size (15 to 18 inches instead of 11 to 13 inches), its much longer wings and tail, its darker and more reddish underparts (the breast being walnut brown in the Passenger Pigeon, cinnamon drab in the Mourning Dove), the deep mouse gray of the Passenger Pigeon (the head is buffy brown in the Mourning Dove), and the absence in the Passenger Pigeon of the black spot which appears so distinctly behind the eye in the Mourning Dove. Stuffed specimens of Passenger Pigeons are still sometimes discovered in old household collections of curios. It is well for those possessing these quaint frames of mounted birds to check them carefully for the possible presence of the Passenger Pigeon. The Mourning Dove has but twelve feathers in its tail, the Passenger Pigeon, fourteen. This point, together with the comparative descriptions given above, will serve adequately to identify specimens in the hand, but even competent observers declare that at a distance of fifty yards the birds in nature could not be distinguished with satisfactory sureness.

It is interesting to note in passing how incomplete is any of our record of the biological past. Had the Passenger Pigeon become extinct before historic times

■ LOUISIANA AND CAROLINA PARAKEETS. The lively and acrobatic postures of this beautiful parakeet are skillfully displayed in the above illustration by John James Audubon taken from his famous "Birds of America", published during 1827-1838. The plate originally appeared in color. The birds are here depicted as feeding on the common cockleburr. One of the individuals here drawn was shot at Bayou Sara near St. Francisville, Louisiana, in 1821. The Louisiana subspecies, the Louisiana Parakeet, is now extinct.

and had we therefore lacked the accounts of contemporary, competent observers we should probably have failed to gain the remotest conception of the vastness of their numbers. Certainly no fossil record survived to give any faint inkling of those prodigious flocks.

THE SHORT-TAILED ALBATROSS

Albatrosses have always been symbols of aerial grace. For some reason yet unclear, Albatrosses, although they journey far north in the Pacific, are, as far as the Atlantic is concerned, birds of the southern hemisphere. One western species, the Short-tailed Albatross, *Diomedea albatrus,* was a common bird along the Alaskan steamship routes until the last century. Breeding only in certain islands on the Asiatic side of the Pacific, especially Wake and Bonin Islands, the Short-tailed Albatross has remained unreported for the last generation of Man. It is highly probable that it is extinct. The factors that have swept it out of existence remain obscure. Most significant probably, however, was the destruction of birds on their limited nesting grounds.

THE HEATH HEN

The Heath Hen became extinct just seven years ago. The last known individual was last seen on Martha's Vineyard, Massachusetts, on March, 11, 1932.

The Heath Hen, *Tympanuchus cupido cupido,* was a subspecies of Prairie Chicken. Two closely related subspecies, the Great Prairie Chicken, *Tympanuchus cupido americanus,* and the Attwater Prairie Chicken, *Tympanuchus cupido attwateri,* both occur in Louisiana, the former as a casual winter visitor in northern Louisiana, the latter, once a common permanent resident of the coastal prairies of Louisiana, but now rare and apparently restricted to a small area in the western parts of Cameron and Calcasieu parishes.

The story of the Heath Hen has peculiar interest in that the extermination of this bird was foreseen for many years, yet in spite of all efforts exerted in its behalf it could not be saved. Once ranging through Massachusetts, southern New Hampshire, New York, Pennsylvania, New Jersey and probably also the Delaware and Maryland shores of Chesapeake Bay, the Heath Hen was wiped out by hunters and other agencies throughout its range with the single exception of Martha's Vineyard, an island off the coast of Massachusetts just below Cape Cod. Dr. Alfred Gross, Professor of Biology of Bowdoin College, who has contributed a classic study of this bird, very kindly provided the writer with the accompanying photograph of the famous last individual.

The Heath Hen was among the first of American birds to be mentioned by the early Colonists. Known as the Heathcocke, the Heath Hen was described by one early New England writer in 1635 as: "Heathcockes and Partridges be common: he that is husband, and will be stirring betime, may kill halfe dozen in a morning. . . ." They then sold for four pence each.

A valuable source of food, easily hunted, Heath Hens disappeared entirely from the mainland of Massachusetts and the State of Connecticut very soon after 1840. Long Island, the New Jersey plains and certain areas of Pennsylvania still held some Heath Hens for several decades, but 1870 found the bird restricted to Martha's Vineyard. A census in 1890 indicated a population of only two hundred individuals, which, in 1896, became less than one hundred.

The year 1908 witnessed a remarkable experiment in the attempt to preserve this vanishing bird from extinction. Six hundred acres of land were purchased and a thousand additional acres leased as a Heath Hen sanctuary situated in the midst of the breeding range. The State Department of Conservation of Massachusetts spent $70,000.00. Societies and individuals contributed many thousands more in an attempt to save this race. At that time only about fifty Heath Hens survived. Previous efforts to introduce the Heath Hen to favorable areas on the mainland or on other islands had without exception failed. Under their new protection, in a well guarded and spacious sanctuary, the birds rose from some fifty in 1908 to probably two thousand in 1915-16.

Then in May, 1916, there broke out a terrific conflagration in the midst of a violent gale. The greater part of the Interior of the Island was swept by this fire, destroying the brooding birds, their nests, their eggs, their food, their cover, over an area of more than twenty square miles. This fire, as Dr. Gross has well expressed it, undid in a few hours the costly accomplishment of many years of thought and work. The winter of 1916-17 was especially severe and brought southward an unprecedented flight of Goshawks, so that where a year before the Heath Hen population stood at two thousand, their numbers, due to fire and Goshawks, were now reduced to one hundred and fifty birds, most of these males since the brooding females had been disproportionately trapped by the fire. Disease then wrought additional catastrophe upon the diminished numbers. Careful censuses were taken. These show too clearly the swift descent into oblivion: 1922, seventy-five birds; 1923, twenty-eight; 1924, seventeen (this was the last year when broods of young were observed and reported); 1927, spring, thirteen birds (including two females), autumn, seven birds (all males); 1928, spring, three males, autumn, two males, December, one male; 1929, one male, studied and photographed by Dr. Gross during April through to mid-May; reappeared again the following autumn and throughout the winter; 1930, this lone bird again observed and photographed; 1931, April, this individual was trapped and banded; observed subsequently until March 11, 1932, which is the last time a living Heath Hen was authentically reported. This single individual had thus represented as far as can be known his whole race for a period of three and a quarter years. A reward of $100.00 offered for the recovery of the remains of this bird, identifiable by two metal bands, has never been claimed. There is something peculiarly pathetic in the picture of the return of this last survivor repeatedly to the "booming" field where the courtship of the birds ordinarily occurred. Last Heath Hen in the world, his mating calls echoed unanswered and then forever ceased. For the first time in history a species was studied in its normal environment down to the last individual of the race. Dr. Gross, in his extraordinarily fine studies of the Heath Hen, conducted with the knowledge that the bird was inevitably doomed, has provided an invaluable and distinguished record of another vanished American.

THE MASKED BOBWHITE

Slightly smaller than the Bobwhite, the Masked Bobwhite, *Colinus ridgwayi,* differs in having a completely black forehead and throat and a brown vest. It resembles our Bobwhite in general habits. Formerly, the Masked Bobwhite occurred in a limited area along the southern boundary of Arizona, living in grass-covered valleys and mesas. Extension of cattle ranges invaded its territory, destroyed its cover and so profoundly disturbed its welfare that the bird has completely disappeared as an existing species north of the Mexican boundary. The Masked Bobwhite, however, still remains within the realm of the living, and, as a matter of fact, one able New Orleans scientist has succeeded in securing eggs of this bird, and has reared and successfully bred the species in captivity. It is therefore possible that unlike the other species thus far discussed the Masked Bobwhite may well be reintroduced into the areas from which it has been exterminated and thus become again a member of the bird family of the United States.

THE LOUISIANA PARAKEET

The Louisiana Parakeet, *Conuropsis carolinensis ludovicianus,* and the Carolina Parakeet, *Conuropsis carolinensis carolinensis,* are the two subspecies of

This exhibit of the Department of Conservation at the annual flower show of the New Orleans Horticultural Society, held at the municipal auditorium in March, 1939, was one of the most attractive displays of the show and elicited much favorable comment.

a single species of parrot native to North America. One other member of the parrot family, the Thick-billed Parrot, *Rhynchopsitta pachyrhyncha*, an inhabitant of Mexican mountains, does occasionally invade certain southern mountains of Arizona, where, however, it is merely a transient in search of food and not a breeding species.

The Louisiana Parakeet was first scientifically recorded in 1788 by Gmelin on the basis of a description by duPratz, the early French traveler in Louisiana. A geographical race, one of its differences from the Carolina Parakeet was its duller color. Parakeets instantly attracted the attention of the early explorers of the areas where they ranged. They appeared to be capable of enduring considerable cold, ranging northward even during the winter. Captain John Smith of Virginia, for example, recorded: "In winter there are great plenty of Parrats."

The original range of the Louisiana Parakeet extended from Louisiana and Mississippi, north to Ohio, Nebraska, Wisconsin and western New York. This bird is now extinct. Apparently the last Louisiana Parakeets reported for Louisiana were from Bayou Sara about 1880, West Baton Rouge, 1880, and the rumored second-hand report of their occurrence about 1900 in Union, Claiborne and Webster parishes. The Louisiana Parakeet, a strikingly marked bird, 13 inches long (about the size of the Mourning Dove), with its conical tail of pointed feathers making up 7 inches of its full length. The body, wings and tail were green, head and neck lemon yellow, forehead and sides of head orange or red.

Sociable, Louisiana Parakeets traveled in flocks often numbering hundreds of individuals. Although clumsy in appearance when on the ground, the Parakeets not only flew with speed and grace, the compact flocks darting in and out of densest timber with ease, but also were extraordinarily agile in their movements out on even the slenderest limbs of trees where, right side up or upside down, they energetically harvested the seeds upon which they fed. Cockleburs, sandburs, seeds of cypress, pine and thistle were favorite foods easily handled by the Parakeets' powerful beaks.

Early morning and late evening were the times of the Parakeet's greatest activity, the hotter hours being spent in thick-foliaged shady trees where were it not for the sound of their low conversational notes it would have been difficult to locate the birds because of the surprising degree with which their bright plumage blended into the surrounding foliage. The shrill call notes were described by Bendire as "disagreeable, a kind of grating metallic shriek," the birds were especially noisy on the wing. One call, resembling the shrill cry of a goose, was frequently uttered for minutes at a time.

One factor that contributed much to the Parakeets' extinction was the fact that this bird was fond of the various cultivated fruits and grains. A large flock sweeping down on a plantation could cause quick and heavy damage. When they invaded apple orchards, the Parakeets were peculiarly destructive since they tore open the whole apple for the single purpose of eating the seeds. Even in 1832, Audubon reported the Parakeets as decreasing in numbers. The early settlers found, to the parrot's further misfortune, that if Parakeets liked their fruit, Parakeets were themselves also good to eat. They were accordingly often systematically hunted as food. The birds were also unfortunate in possessing the peculiar habit of returning whenever one of the members of the flock was wounded so that the destruction of the entire group was relatively easy.

Little appears to be known concerning the nesting habits of the Louisiana race. Bendire notes eggs taken in St. Mary parish in March, 1878. It is quite probable, however, that the nesting and other habits differed little from those of the Carolina subspecies.

Parakeets nested in hollow trees, both cypress and sycamore being reported as nesting sites. Strangely enough, no good account of the nesting habits of the Parakeet has ever been recorded. Audubon himself appears never to have examined a nest of this bird. The white eggs were probably laid in June.

There is some recent evidence of the possibility of the survival of a few Carolina Parakeets in certain remote South Carolina swamps, but this has not been confirmed. Unfortunately, no doubt whatever remains that the Louisiana Parakeet is extinct.

Man undoubtedly was responsible for wiping out the Parakeet as a North American bird. Where they became a pest to orchards, the birds were readily and ruthlessly slaughtered. Vast numbers were taken by professional plumage hunters before an aroused public opinion finally terminated such vicious practices. Thousands of Parakeets were trapped and sold into captivity as cage birds. The stupid slaughter of thousands more by hunters, simply for the sake of shooting at something, added a still greater drain upon a species whose habits were already by nature ill-adjusted for safe survival in proximity with man. The attitudes of this bird, now forever lost to the Louisiana avifauna, are well shown in the accompanying illustration by John James Audubon. It is interesting to note that Audubon included in this group portrait one Louisiana Parakeet he had taken at Bayou Sara near St. Francisville.

[Turn to Page 49]

■ The picturesque Waterlily graces many a roadside pool.

Beautiful Plants Pay Dividends

By

Clair A. Brown

Associate Professor of Botany, Louisiana State University

Plants with beautiful flowers pay dividends, tangible as well as intangible. To many who think of plants only in connection with their aesthetic appeal, it seems almost incredible that a dollar and cents basis can be placed upon the attractiveness of flowers. The business man is slowly awakening to the fact that the jingle of the cash register is often due to the multitude of people who come miles to see and drink in the beauty of gorgeous flowers.

Mankind has loved and cultivated plants for ages. In the past ten years many people have experienced an increase in leisure time, which in many instances has been turned into "puttering around in the garden." We have seen gardening fads sweep across the United States faster than miniature golf courses. However, rock gardening, lily pools, and other forms of gardening have led to a more intense interest in plants. Countless garden clubs have been formed, which with their instructive programs have stimulated an increased interest in growing plants for pleasure and in the use of desirable shrubbery for landscaping. Attractive plantings and the influence of flower-loving people have caused the progressive organizations to improve their city or village. As a result the mention of certain places calls to mind the plants for which these places are famous. One cannot think of Mobile, Alabama, without connecting it with the Azalea Trail; Ashville, N. C., with the Rhododendron Festival; Miami, Florida, with Oleanders; and Rochester, N. Y., with Lilacs. Many other examples could be cited where the local chambers of commerce have come to realize the value of their local gardens as a drawing card for tourists.

Many people do not realize to what extent beautiful plants pay dividends. The following are some of the more important examples which are familiar to all.

THE TOURIST TRADE

Last year 60,000 visitors toured the Azalea Trail in Mobile. If each tourist spent an average of ten dollars, and often it is much more, it is easy to see how a $600,000 business has added to the general prosperity of the community. This same prosperity is shared along the road for considerable distance.

Over 25,000 guests from forty-seven states enjoyed the hospitality of the Old South at Natchez in the double attraction of beautiful gardens and attractive antebellum homes. Aside from the fee paid for the privilege of visiting these show places, think of the income to the local hotels, restaurants, gas stations, and frequent purchases from the merchants in general. In Natchez part of the fee is used to defray the expense of restoring and improving the gardens and houses in the pilgrimage. Money which is respent locally aids the community prosperity.

The southern papers have carried many a news item about the several communities which are opening their homes and gardens for pilgrimage tours this year for the first time. As I write this the radio carries an invitation to visit the gardens in the South, and what is more, the announcement is being made from thirty-two stations.

Gardening is a hobby which is not only healthful but educational and a lot of fun, along with hard work. The hobby has a good financial foundation. Of course, there are many whose expenditures must be limited to a few cents spent for seeds, but there are a large number who do, even though they cannot afford it, spend from three dollars for a single Narcissus bulb to ten or twenty-five dollars for an Iris plant. Here in Louisiana there is one instance where a person paid $800 to have a large Azalea for the garden. We need only to examine the varied line of new tools and gadgets which is being introduced to see that the manufacturers recognize and are meeting the demands of the gardening public.

"GARDENER'S TRAVEL BOOK"

The "Gardener's Travel Book," 390 pages by Edward Farrington, lists many of the important beauty spots in each state which may be seen through the courtesy of the Garden and Floral Societies. It includes mention of festivals and pilgrimages galore, with addresses where one can secure accurate information for the floral shows which vary yearly because of climatic conditions.

■ Tourists are delighted with scenery which includes attractive palms. This group is at Jungle Gardens, Avery Island, one of the show gardens of Louisiana.

Garden clubs have been organized throughout the nation. There are at present two main federations. The Garden Clubs of America, which has 119 affiliated clubs with a membership close to 8,000, and the National Council of State Garden Clubs with 2,000 affiliated clubs and membership of 120,000. Here in Louisiana there are twenty-five clubs in the Louisiana Federation of Garden Clubs with a membership of approximately 1800. There are a large number of specialty organizations, some of which are Azalea and Camellia Society of America, Cactus and Succulent Society of America, Fern Society, Amaryllis Society, Rose Society, Iris Society, Orchid Society, Chrysanthemum Society, Dahlia Society, and Delphinium Society. These are organizations of growers and lovers of flowers who have organized to promote the welfare of their respective flowers.

Let us look at what is being done in Louisiana. To tell all the activities of the Louisiana Garden Clubs, important as they may be, is beyond the scope of this article, so only a few of the highlights will be mentioned. Flower shows once or twice each year are held by most of these organizations. These are instructive as they show what a multitude of beautiful plants are being grown in the State. Many a person has received a thrill to see a coveted blue ribbon attached to some plant which has received tender care for weeks or months. The garden clubs and members have been generous in giving flowers to the sick, to hospitals, and in the planting of shrubbery and trees for civic improvement. Funds have been donated for many worthwhile projects. Books have been given to libraries. Determined individuals backed by the membership of the garden clubs were responsible for the last session of the Louisiana legislature passing a bill designed to protect the wild flowers, trees, and shrubs along our highways, not only from the commercial concern who frequently takes truck loads of plants but also the vandals who thoughtlessly destroy much. Education of the general public into an appreciation of plants, wild as well as cultivated, is needed. The cities such as Shreveport, Natchitoches, Monroe, Lake Charles, Jennings, Baton Rouge, Alexandria, and New Orleans have garden tours for members of their clubs. Lafayette is known for the Camellia Carnival, and bids to be known as an azalea city. New Orleans celebrates with a Spring Fiesta with two garden tours in connection. This year St. Francisville has organized the Audubon Pilgrimage. Ruston is noted for its beautiful Red Buds. Vidalia plans to have a Wisteria Way with plantings of Wisteria at intervals on the Vidalia-Ferriday highway. The Oleander was officially adopted as the city flower by New

■ Interesting designs made with certain rock gardening plants attract attention.

■ 1. This is one of the rarer types of Cactus which grows wild in the State. Its flower is light yellow and charming. ■ 2. Stuartia malachodendron, a wild relative of the cultivated Camellia which is sometimes called Wild or Silky Camellia. Common in some sections of Louisiana. ■ 3. Portrait of an Azalea flower. These come in many colors, white, red, purple, orange, yellow, scarlet and many intermediate hues. ■ 4. The Wild Azalea, Azalea canescene, is a familiar plant to those who live in the pine woods areas of Louisiana. ■ 5. Portrait of a Camellia flower. One illustration cannot do justice to a species which has over 600 named forms. These flowers may be single, semi-double or very double in white, pinks, and reds of varied hues.

Orleans in 1923. Now considerable attention is being given to Azaleas and other shrubs. Grand Isle is the place to see Oleanders. Here they arch over the little lanes that cross the island and flower in profusion.

BEAUTIFICATION PROJECTS

The city fathers of New Orleans are realizing the drawing power of plants at Mardi Gras time. It is a common sight to see the familiar red, white, and blue W. P. A. sign with the legend "Beautification Project." The improvement of the boulevards in the past five years is astonishing. These plantings five and ten years from now will go a long way toward establishing New Orleans as the leader in beauty appeal for the tourist.

Occasionally we have civic-minded individuals who can see the importance and have the funds to make plantings as has been done by Miss Katherine Hill of Port Allen. She has given 5000 Crepe Myrtles to Baton Rouge. These have been planted along the neutral grounds on many of the leading streets. The mid-summer show of the Crepe Myrtles is especially attractive at a time when most gardens are quiet.

The Federal Government realizes that highway beautification is so important that one to one and one-half per cent of each construction project must be set aside for landscaping the highway. Think of the appeal to the tourists of the palm planting on the boulevard from the Huey P. Long bridge to Carrollton Avenue in New Orleans. Around $17,000 has been spent in improving this boulevard. Most of the Palms would retail from fifteen to twenty dollars each. The general public needs education into an appreciation of what is being done to improve the highways. In Texas it is reported that every man from the day worker up to the political chief takes it upon himself to be personally interested in the planting.

WILD FLOWERS CULTIVATED

Our cultivated plants which we prize so highly are wild somewhere in the world, or have been derived from wild plants. Native plants are often freer from pests which make some of the introduced plants so difficult to grow. Holly, Dog wood, Red Bud, Wild Azalea, and Iris are just a few of the wild flowers which are commonly naturalized in our gardens. Many others are worthy of study and will in time be naturalized extensively. Just one example to show the interest in wild flowers—the State of New York published a two-volume set devoted to wild flowers of that State. This publication was written by H. D. House, State Botanist. It contains 264 plates illustrating 364 wild flowers in natural color. Both State editions were sold at a price of $7.00 per set. After the State editions were exhausted, McMillan & Co. brought the material out in one volume. In a little over three years they sold 40,000 volumes for a sum of

$225,000 and the price dropped from $7.50 to $3.95 per volume. This has taken place in competition with a flood of books on plants, gardening, and related subjects. In connection with this publication, I wish to quote from a news item by Mildred Seydell in an Atlanta, Georgia, paper. "Different kinds of wild flowers stump Georgia experts. Garden clubs of Georgia, get busy. We'll all back you. Get out a book of wild flowers of this State !!—We gathered several different kinds of wild flowers that even such experts as my companions couldn't name.—Had to resort to New York State's book of wild flowers. Now this shouldn't be. A group of Georgian wild flower lovers should underwrite a volume that would be sponsored by both the women's and men's garden clubs. Something with colored prints. We don't want any piefaced edition. We want to have it so splendid that all America will talk about it. A grand publicity stunt for our State, what with everyone interested these days in gardens and the out-of-doors."

What do we have in Louisiana? At present there is no complete book on the flora of the State. There are between 3500 and 4000 species of plant native to Louisiana. Between eight and nine hundred species are worthy of illustrating, that is, plants which will attract the average person without a technical training.

Miss Caroline Dorman has published the first book on the wild flowers of Louisiana in which seventy-three species are illustrated in color, and twenty-four more by line drawings.

A more complete book on the flowers of the State will be published when the people demand it. There are filed in the University Herbarium at Louisiana State University, over 14,000 specimens. These with future collections will enable us to tell what plants grow in the state, where they occur, and will form the basis for State flora.

* * *

Vanished Americans

[Continued from Page 45]

SPECIES ON THE "MOST DANGEROUS" LIST

Three species of North American birds are at present so reduced in numbers that their survival is in greatest danger. These are the Trumpeter Swan, the Whooping Crane and the Ivory-billed Woodpecker.

One of the largest and most impressive of our native birds, the Trumpeter Swan, *Cygnus buccinator*, formerly bred from Alaska and northern Canada south to British Columbia, Alberta, western Montana, Wyoming, Nebraska, Iowa, Missouri and Indiana, and wintered from western central British Columbia and the central Mississippi Valley to the Gulf of Mexico and southern California. Now the species survives in a wild state only in British Columbia, Alberta and the Yellowstone Park region. The bird was formerly perhaps a fairly common winter resident in the Gulf areas of Louisiana. The last individuals recorded for the State were in 1914 and 1915. The Trumpeter Swan was notable for its low-keyed and horn-like call recorded as being audible over a distance of miles. It is believed that Man as a hunter played but a small part in reducing the numbers of the Trumpeter since even in early days relatively few of these birds were shot although the young Swans provided excellent food. The activities of predatory animals, particularly the coyote which has extended its range into Swan country, have undoubtedly been important factors. Today it is estimated that some five hundred birds survive scattered through northern British Columbia while in the Yellowstone region probably only some seventy-five birds now remain. Rigorously protected, this Yellowstone group, the last wild Trumpeters in the United States, is responding favorably and increasing in numbers. Their ultimate survival will require most vigilant care.

The Whooping Crane, *Grus americana*, once bred from Mackenzie and Hudson Bay south to Nebraska and Iowa and occurred in migration east as far as the Atlantic coast, and wintered from the Gulf States southward into central Mexico. Today, this truly magnificent bird is very rare, mainly restricted in its breeding to southern Mackenzie and northern Saskatchewan. Fifty inches in length, white in plumage, with the exception of black primaries, and with a bare, red face, the Whooping Crane always attracted instant attention. The long journeys that separated the Whooping Crane's breeding ground from its winter home added to the perils of its existence, since its noble and conspicuous appearance too often attracted the fatal attention of casual hunters. Whooping Cranes do winter regularly in Louisiana, but their numbers are few. The problem of protecting a bird whose travels traverse such wide regions presents extraordinary difficulties, and it seems inevitable that unless the most rigid protection be given this species it will soon pass from the North American avifauna.

The story of the Ivory-billed Woodpecker, *Campephilus principalis*, is one of peculiar interest to Louisiana since there exists in our State one of probably only several known surviving groups of these birds. The Ivory-bill, the largest member of its family in the United States, once ranged in the South Atlantic and Gulf States from Texas to North Carolina and north in the Mississippi Valley to Oklahoma, Missouri, southern Illinois and southern Indiana.

The Ivory-bill still survives in a Louisiana sanctuary carefully guarded by the Department of Conservation. However, the reproductive success of this species appears to be slight, and since the numbers of this bird are so greatly reduced the species is in a most precarious situation in spite of the just attention that is being devoted to it. The Ivory-bill was formerly shot for food, for the sake of securing its striking bill as a souvenir or simply for the sake of shooting a large and beautiful bird. Relatively unsuspicious, and most conspicuous, it was an easy target. Non-migratory, Ivory-bills may spend their whole lifetime within an area of a few acres. So few still survive that the task of insuring the perpetuation of this magnificent species calls for the most rigorous application of every possible safeguard and resource.

Such has been the story of these vanished Americans. It is easy to become nostalgic about the past and to become sentimental about lost species but we must remember that an incalculable number of species have become extinct during the earth's biological history. Long before the advent of Man on earth species competed for existence and the losers paid the inevitable price of defeat. The earth itself would be much too small to hold all species that have lived. Nevertheless, it must be realized that it is a long vista of millions and millions of years of earth history that we look back upon and that since Man's relatively successful conquest of the earth the biological pattern of the world has been most profoundly altered at an unprecedented and accelerating pace.

Man of all earth's creatures has attained preeminent power. He has developed the ability to shelter himself better and to kill more and kill at a greater distance than any other living organism.

Conservation, thoughtfully organized and unrelentingly enforced, is the only instrument that can save for posterity the endangered, desirable species of our wildlife. It is a task that challenges Man's keenest thoughtfulness, ability and power.

* * *

SPAWNING CONDITIONS

Most fishes are particular about their spawning conditions. Bass, and other nest building fishes, pick out only certain types of bottoms on which to build their nests. Wall-eyed pike prefer to spawn in inlet streams or on gravel reefs where the eggs will be continually washed by currents. Each species of fish has its own particular preference for spawning conditions.

Construction and Mechanical Operation of Fish Hatcheries in Louisiana

By
Donald E. Fuellhart*

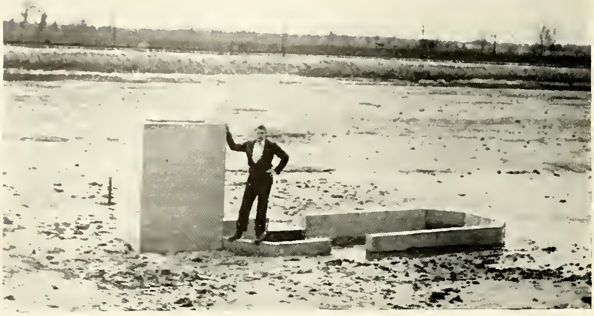

Fig. 4

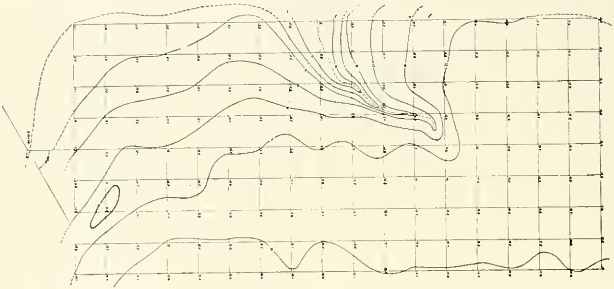

Fig. 1

PLANNING

The first step after selecting the site of the fish hatchery is to make a field survey of the area, recording topography and contour elevations at one foot intervals. From the field data, maps are drawn (Fig. 1) and plans are prepared (Fig. 2) showing the limits of the ponds, locations of the outlet boxes, drain lines, supply lines, pump house and other details.

When the plans are completed an estimate of the cost of the project is made and specifications and proposals to bidders for construction are prepared.

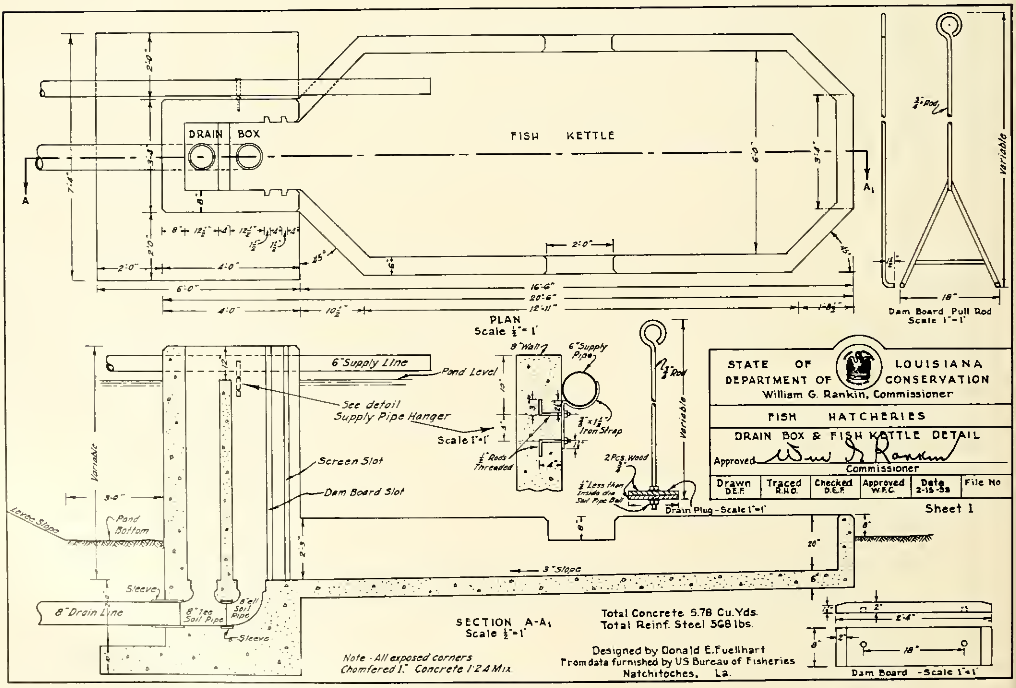

Fig. 3

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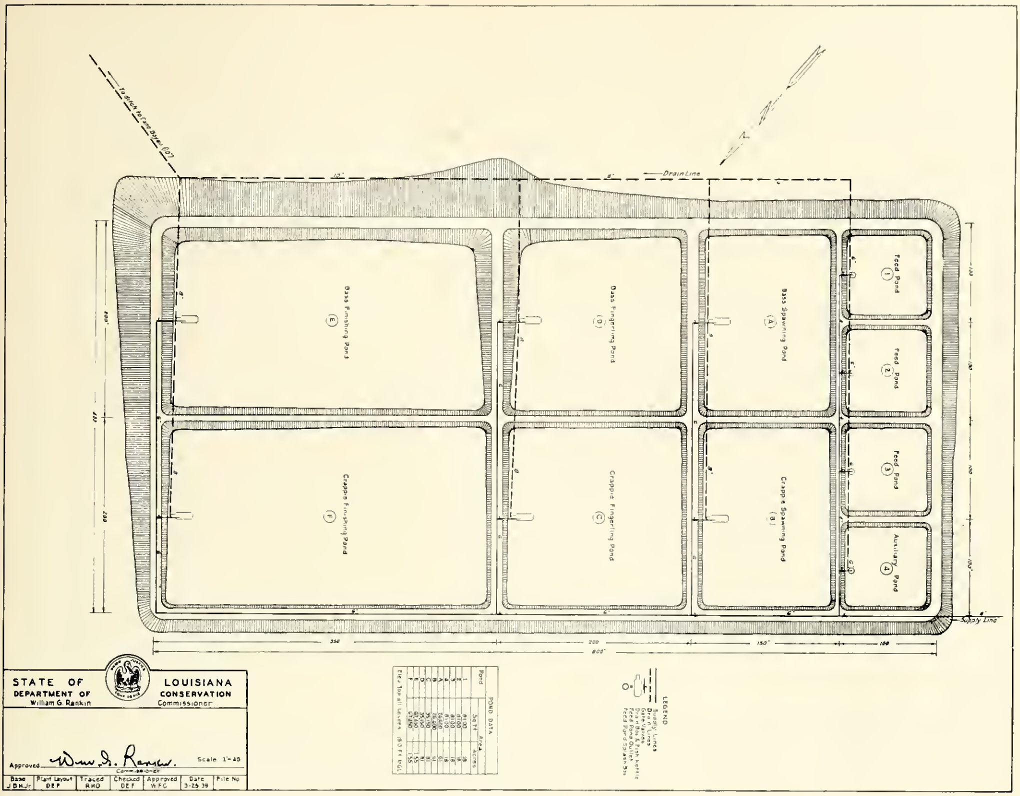
[*] Civil Engineer, Department of Conservation.



POND DATA

Pond	Area Sq Ft	Area Acres
1	8100	.18
2	8100	.18
3	8100	.18
4	8100	.18
A	26,600	.61
B	26,600	.61
C	35,150	.81
D	35,150	.81
E	67,450	1.55
F	67,450	1.55

Elev. Top all Levees 18.0 Ft MGL

Fig. 2

CONSTRUCTION

The earth levees may be built by the wheelbarrow method, teams and fresnos or machinery. Earth is excavated from the pond area and placed around the edge of the pond to form the levees of the shapes as shown in Fig. 5. The pond bottom is graded to drain gently to a convenient point at one side of the pond. It is important to prevent seepage at the contact of the natural ground and the levee, or through the levee. If porous material occurs where the levee is built a trench is excavated and filled with selected impervious material. The levee itself is built up in layers of suitable materials placed in thin layers and compacted to the proper degree.

At the point of lowest elevation to which the pond bottom has been graded a combination drain box and fish kettle is constructed (Figs. 3 and 4). In the small feed ponds inlet splash boxes and drains are constructed as shown in Figs. 6 and 7.

Drain lines usually of 8-inch pipe are laid from each drain box to a central drain line which carries the water to its original source or to some other point of disposal.

A system of supply pipe lines is buried on top of the levees to supply water to the ponds. Gate valves are placed in these lines to regulate the flow to various ponds.

If the water supply is obtained from a lake or bayou, a pump and motor are installed to pump water into the supply system. In some parts of Louisiana the water supply may be obtained from an artesian well, which flows into the supply pipe line system under its own pressure. However, if upon analysis the well water is found to be lacking in oxygen content or to contain impurities harmful to fish and vegetable life, it must be aerated to gather oxygen and treated before flowing to the ponds.

Living quarters are built for the caretaker and a fence is usually constructed around the property.

OPERATION

Filling the ponds with water may require twenty-four hours or longer, depending on the size of the pond and the rate of delivery. Supply inlets are located at the lowest point of the pond, which is also the location of the drain box and fish kettle. Inlet water will then fall upon the concrete fish kettle which will serve the purpose of a splash box, preventing scouring of the pond bottom. Should the inlet water enter the pond at the upper end, it would gravitate toward the drain box at the lower end, causing erosion of the pond bottom and deposition of silt and vegetation at the drain box.

The ponds are filled to within 12 to 18 inches of the top of the levee, which elevation is controlled by the middle wall of the drain box (Figs. 3 and 4). The front drain outlet is plugged and the pond may be kept at constant level, with any excess water spilling over the middle wall into the rear drain. A fish screen is placed in the front slot of the drain box and dam boards are placed in the rear slot.

If for any reason the water level is to be lowered, a sufficient number of dam boards is removed from the slot to allow the water to subside to the desired level. The drain plug in the front drain is then removed, allowing the water which passes over the remaining dam boards to drain from the pond.

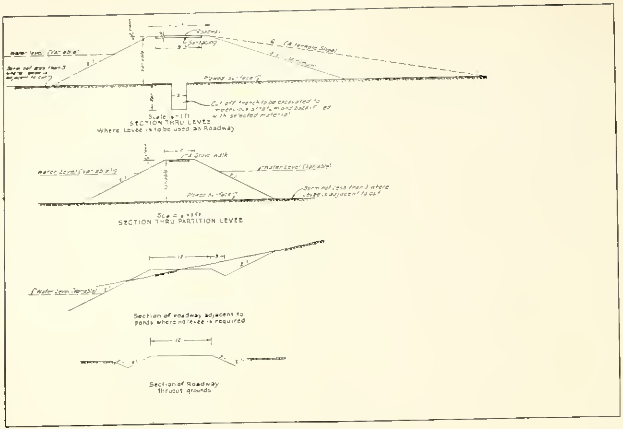

Roadway
Surfacing
Water level (Variable)
Berm not less than 3 where levee is adjacent to cut
6 : 1 (Alternate Slope)
3 : 1 Minimum
Plowed surface
Cut off trench to be excavated to impervious stratum and backfilled with selected material
Scale ⅛"=1 ft
SECTION THRU LEVEE
Where Levee is to be used as Roadway
Gravel walk
Water Level (Variable)
Water Level (Variable)
Variable
Plowed surface
Berm not less than 3 where levee is adjacent to cut
Scale ⅛"=1 ft
SECTION THRU PARTITION LEVEE
Water Level (Variable)
Section of roadway adjacent to ponds where no levee is required
Section of Roadway thruout grounds

Fig. 5

When the time comes to remove the fish from the pond, the water is lowered in easy stages by removing one dam board at a time. Since the fish kettle is placed at the lowest elevation of the pond, the fish are naturally drawn into it through the slots in each side.

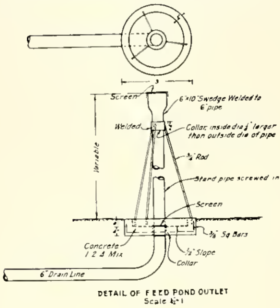

Screen
6"×10" Swedge Welded to 6" pipe
Welded
Collar inside dia ⅛" larger than outside dia of pipe
¾" Rod
Stand pipe screwed into collar
Screen
Variable
⅜" Sq Bars
Concrete 1 2 4 Mix
½" Slope
Collar
6" Drain Line
DETAIL OF FEED POND OUTLET
Scale ½"=1'

Fig. 6

Men equipped with waders then stand in the fish kettle, remove the fish with dip nets, place them in large milk cans, hand-counting them during this operation. The milk cans are hoisted to the top of the drain box, carried over a runway from the top of the drain box to the levee and placed in a truck at this point. They may then be delivered directly to the point of ultimate distribution.

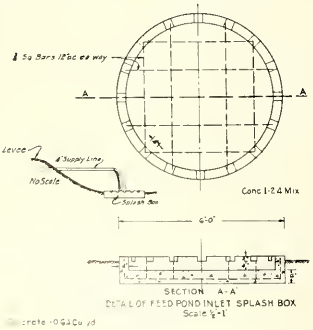


Fig. 7

ACKNOWLEDGMENTS

The writer is indebted to Mr. H. C. Minch, Superintendent, U. S. Bureau of Fisheries, Natchitoches, Louisiana, for furnishing much data and information used in the preparation of this article.

* * *

New Plant For Geological Study

[Continued from Page 8]

There is a yearly expenditure of about $5,000 on this library, which now represents an investment of at least $50,000, although of course some of its rare books are almost priceless.

The thoroughness with which this library has been collected may be illustrated by a story about Dr. R. J. Russell, who has given a good deal of his time to building it.

It seems that Dr. R. J. Russell was last year commissioned by the Association of American Geographers to make a special study of the Rhone delta in France. The greater part of his time since his return last September has been devoted to library investigation of conclusions reached by others who have studied the Rhone. Though no such investigation was contemplated during the years of library growth he has found it practically unnecessary to go outside of the library which he had helped Dr. Howe to assemble, to obtain all of the information that has been published on the Rhone delta—in fact, the most complete reports on all of the world's deltas have been collected here as a basis of comparison with our own Mississippi River delta.

With the additional area of the new plant there will be more space for expansion of the library facilities, which will occupy the entire northern half of the old wing.

Somewhat related to the library is the map collection, which will occupy a large room, 60 feet long by 11 feet wide, in the new building. Included in the collection are all of the U. S. Government geological maps—over a thousand mounted maps, 200 wall maps, and detailed topographic and geologic maps of practically every part of the earth.

The new building will provide much needed space for the offices of the School's various department heads, lecture rooms and museums. There will be six specialized museums; the largest that of the department of anthropology, in the northern half of the new wing, on the second floor. Others will be devoted to economic geology, fossils, rocks, minerals and petroleum engineering.

Offices and laboratories of the Research Division of the Department of Conservation will be located on the ground floor of the new wing. Here there will be ample space and equipment for the continued investigation of those problems in which the Department is particularly interested.

FIELD WORK

The practical work of the School of Geology and the State Geological Survey is by no means restricted to this plant and its laboratories, lecture rooms and museums. There are nine parties presently engaged in field work in various parts of the State, under the direction of Dr. Howe's associates, Dr. R. J. Russell and Dr. H. N. Fisk.

Dr. Russell's studies and discoveries in the field of geography have earned for him an international reputation. Last year he was an official delegate of the U. S. Government to the International Geographical Congress in Amsterdam. In fact, the outstanding record of the professors and many of the graduates reflect credit on the School of Geology under Dr. Howe's leadership.

* * *

ANTS ARE GOOD HOUSEKEEPERS

Ants are good housekeepers and tidy up after every meal, if evidence of their technic of garbage disposal at the headquarters of the Southwestern National Monuments near Coolidge, Arizona, can be relied upon.

At the base of each anthill is a ring of saltbush seed scales. These point to the fact that the ants carry the seeds down to their underground cafeteria, remove the hulls, and bring back the refuse to discard at the foot of their anthills.

The School of Geology

[Continued from Page 10]

charge of a rapidly growing collection now containing over 8500 bound volumes, in addition to governmental reports, pamphlets, manuscripts and miscellaneous documents. The library is noteworthy for complete sets of periodicals and contains the most important English, French, Italian, Belgium and German geological publications as well as those of the United States. Especially complete are the reports of Geological Surveys of other states of the Union. Practically any type of geologic research may be carried out in this library without the necessity of borrowing from the Library of Congress or elsewhere. The Library serves more than the needs of students and the Geological Survey. Hardly a week passes but what professional geologists, after coming from Shreveport, Lake Charles, or Houston, find their way to the School of Geology in order to avail themselves of its library facilities.

THE MAP COLLECTION

The map collection contains somewhat over 250 wall maps, complete sets of topographic quadrangles and geologic folios of the United States and the International Map of Hispanic America. Geologic maps of practically every country of the world and the detailed geologic maps of several European countries are in the collections. A departmental policy adopted several years ago and followed faithfully, provides for especially complete maps of all countries facing the Gulf of Mexico and Caribbean Sea, also all large delta areas. Now the most complete geologic and topographic maps of the Netherlands, Po Valley, Rhone Valley and other areas resembling Louisiana geologically are on hand.

The well log collection carries the complete records of approximately 30,000 oil and gas wells in Louisiana. Schlumberger logs are filed with the Department of Conservation and are available to the Research Division.

Since the Legislative Act of 1936, operators are required to furnish cuttings and cores of all Louisiana oil and gas wells to the Department of Conservation for use of the Geological Survey. On the average, this means the arrival of about 300 pounds of samples per day at the Research Division. The collection now includes samples from about 3,000 individual wells in Louisiana, making a total of 400,000 samples. Samples are stored on racks and are located as readily as books in a library. As these samples are needed for a particular report, the samples are washed; then the microfossils are picked by hand from the residue, with the use of a microscope; the faunas are identified and placed in slides for permanent reference.

Even prior to the Act of 1936, individual oil companies had begun to use the School of Geology as a deposition for well cores. Outstanding is a gift of 60,000 cores from the Humble Oil and Refining Company. The California Company, the Texas Company, the Vacuum Oil Company and other operators also have made large donations of cores.

The paleontological collections of Dr. Howe and the School of Geology form an invaluable asset to the functioning of the Geological Survey. A microscopical collection contains living and fossil shells, bones and other hard parts of animals from all parts of the earth. The microfossil collection is one of the largest and most useful in existence. Some 5000 species are represented from some several thousand localities. Several thousand detailed faunal slides of foraminifera, ostracoda, bryozoa and otoliths have been prepared from the type localities of over 200 formations in the area of the Atlantic and Gulf Coastal planes. A departmental policy of 15 years standing has provided for collecting fossils from the type localities of all southeastern states.

DETAILS OF PARISH REPORTS

Before completing a parish report, the author must examine all well cores in and near his area. Microfossils from samples collected in the field and from cores in the Geological Survey collections are compared with those in the type locality collections, making identification of subsurface formations possible in order that drilling depths to horizons of economic interest may be estimated. Well log, Schlumberger log, and subsurface studies of structures developed and producing oil, gas, sulphur or other mineral resources furnish information necessary for the cross sections so abundantly furnished in the parish bulletins. Oil companies and land owners have made a high degree of accuracy possible in detailed maps and sections as a result of their cooperation in furnishing information from their files to the Survey.

The base maps and illustrations in the geological bulletins are prepared by the cartographer of the Survey, Mr. G. O. Coignet. Each base map is an original production and incorporates the most accurate information available from maps of the United States Geological Survey, United States Coast and Geodetic Survey, United States Bureau of Soils, Louisiana State Engineers office, Louisiana Highway Commission, aerial photographs and other sources of information. In several cases it has been necessary to construct plane table maps in the course of fieldwork and the general absence of contours on the maps of much of the State has required an intensive use of Paulin altimeters as an integral part of fieldwork. The cartographic excellence displayed in the bulletins has received enthusiastic acclaim from many sources. It has become impossible, however, for Mr. Coignet to perform all the cartographic tasks with which he has been confronted during the past year and thus the appointment of an assistant cartographer is to be made at the end of the coming field season.

IMPORTANCE OF THE SURVEY

The growing importance of the Geological Survey demanded, as early as 1934, that the State Geologist transfer his office from the University to New Orleans, where he has since remained. An assistant State Geologist, Mr. James H. McGuirt, was then appointed to continue with the duties of conducting the University office of the Survey. In the fall of 1938, Mr. McGuirt accepted an assistant professorship in the School of Geology and Mr. Dee David Gooch was appointed assistant State Geologist. The editorial and secretarial demands of the University office of the Survey require the full-time services of two secretaries. The maintenance of the collections, washing of samples, determination of microfossils, and other technical duties of the Research Division requires part-time services of 49 University students, of whom six are graduate students.

In order to develop the graduate program of the School of Geology and to furnish the State with the best possible geological survey at lowest possible cost, compatible with a highest degree of scientific accuracy, the initial plans of the Geological Survey contemplated the employment of graduate students as geologists, field assistants and assistants in maintaining collections. This policy has made it possible for many students who otherwise would have been unable to fully avail themselves of the opportunities offered by the University to pursue graduate work and gain valuable practical experience. While a somewhat greater degree of faculty participation in the field duties of the Survey than originally contemplated has been necessary in order to maintain publication schedule, the policy of providing practical training for graduate students has been successfully carried forward. During the summer of 1939, six faculty members and 12 graduate students will be in the field preparing reports on the geology of Bienville, East Baton Rouge, East and West Carroll, Natchitoches, Jackson, Red River, Vernon, Sabine, De Soto, Washington, and St. Tammany Parishes.

COMPLEMENTARY SERVICE

While the presence of the School of Geology of Louisiana State University has made possible the unparalleled efficiency and economy of the existing Louisiana Geological Survey, the latter has in no small measure contributed to the welfare and success of the former. Most obvious, at the moment, is the great new geology building on the University Campus, built and equipped chiefly as a result of the contribution of the Louisiana Department of Conservation. The need for the building followed a congestion arising from causes of both survey and school. Increasing collections had rendered former storage space wholly and pitifully inadequate. Increasing personnel required office and laboratory space unavailable in the old quarters. Increasing student load required a larger faculty and more space for lecture and laboratory instruction. Increasing significance of Louisiana as a mineral producing State required not only the maintenance of the Geological Survey as originally contemplated but required an expansion in the scope of its activities. Industrial development required an investigation of water, fuel and other mineral supplies. It was found that the State Highway Department could effect material economies if the gravel and sand deposits of the State were adequately mapped in terms of location, quality, availability and volume. Shell deposits are an increasingly important resource which must be surveyed in a like manner. Particularly urgent is the need for a clay survey in order that ceramic industries be encouraged to locate factories at suitable sites.

The cooperation of outside agencies with the School of Geology has been encouraged and assists in centralizing at one site, the new geology building, the outstanding Geological Research center of the South. Office and laboratory space has been furnished to two separate divisions of the United States Geological Survey, one of these is concerned with surface waters, the other with underground waters. The Minerals Division of the Department of Conservation is establishing a laboratory of research in petroleum, chemical, and sanitary engineering as well as its research statistical division in the building.

FACULTY PERSONNEL

The faculty of the School of Geology has been increased as a result of increased research and student demand. When the history of the School of Geology was published in the April 1933 issue of the Louisiana Conservation Review, Dr. H. V. Howe, Dr. R. J. Russell, Dr. F. B. Kniffen, Assistant Professor B. C. Craft and Dr. R. Dana Russell constituted the faculty staff. To these have been added: Dr. H. N. Fisk in 1937, who served one year on the Geological Survey after obtaining his doctorate at the University of Cincinnati and prior to his University appointment; Dr. C. J. Roy, in 1937, formerly an instructor in geology at Harvard University; Dr. J. H. McGuirt, in 1938, after serving four years as Assistant State Geologist of Louisiana; Assistant Professor Sylvan Cromer, in 1938, formerly assistant professor of natural gas at the University of Oklahoma; and Mr. James A. Ford, who obtained his Master's Degree in Anthropology at the University of Michigan in the spring of 1938, after several years of anthropological research in Louisiana and neighboring states under the auspices of the Smithsonian Institute of Washington and the Louisiana State University, was added in 1938 as Research Anthropologist.

The presence of a distinguished faculty, notable library, famous collections, and internationally recognized research center has built enrollment in the School of Geology to levels from an original graduating class of 2 in 1926 and 6 in 1927, to 13 in 1936, 17 in 1937, and 34 in 1938.

The undergraduate enrollment for the first semester of 1938-39 was 250; in Geology 89; in Pet. Engr. 161. The graduate enrollment is 34 making a total of 284 students majoring in the School of Geology.

A total of 1113 course enrollments was reached during the fall of 1938.

GRADUATE STUDENTS

The School of Geology has now graduated or given advanced degrees to over 195 students. About an equal number have graduated from the College of Arts and Sciences with Geology as their major subject—The Ph.D. degree has been granted to:

Chawner, William D.
Kyser, John
McGuirt, James H.
Taylor, Ralph E.

The degree of Master of Science has been granted to:

Alexander, W. A.
Blouin, Cecil
Bowie, Helen
Broussard, M. V.
Brown, Harry Bates Jr.
Chambers, Robert Jack
DeBlieux, May W.
Dohm, Christian F.
Dunbar, Clarence Peckham
Garrett, J. B. Jr.
Harris, R. W.
Hough, Leo W.
Johnson, T. J.
Keller, Josephine G.
Kirkpatrick, H. L.
Lea, Joseph W.
Mayer, Maurice
McGuirt, James H.
Monsour, Eli T.
Monsour, Emil
Moresi, Cyril K.
Postell, W. D.
Roberts, Marion S.
Routh, Ben
Smith, Frederick Emmett
Wallace, William E.
Warner, A. D.

The alumni of the School of Geology are distributed approximately as follows:

Louisiana, 155
Oklahoma, 4
Virginia, 1
North Carolina, 1
New Mexico, 2
Pennsylvania, 1
Kansas, 1
New York, 1
London, England, 1
Venezuela, S. A., 4
Texas, 77
Mississippi, 3
Wisconsin, 1
Tennessee, 1
Washington, D. C., 3
Arkansas, 2
Colorado, 1
Argentine, 1
Mexico, 1
Java, 1
Papua, 1

The complete list of alumni, with addresses so far as known, follows:

Abendroth, F.—Humble Oil and Refining Company—Freer, Texas.
Adams, J. L.—Monroe, La.
Adkins, W. S.—Shell Petroleum Corporation—Houston, Texas.
Albritten, P.—Baton Rouge, La.
Alexander, W. A.—Louisiana Division Manager, Shell Petroleum Co.—Iowa, La.
Asseff, A. G.—Louisiana Department Conservation—Lisbon, La.
Baldwin, E. F.—Hughes Tool Company—Lafayette, La.
Barthel, Joseph—Humble Oil Co.—Kingsville, Texas.
Barkley, S.—Geophysical Company—Houston, Texas.
Barrett, Jeff—245 Vine Street—San Antonio, Texas.
Barrow, Alston B.—Box 608—Lafayette, La.
Baskin, Archie—Manager Roseland Cemetery—Baton Rouge, La.
Baumgarten, Fred—110 N. Ryan Street—Lake Charles, La.
Beaird, Tom—Humble Oil Company—Tyler, Texas.
Bernard, Allen—L. S. U.—University, La.
Beville, Bob—Humble Oil Company—Freer, Texas.
Blouin, C. F.—Production Geologist—Box 251—Alice, Texas.
Bourg, Bobby—Scout—Humble Oil Company—Tyler, Texas.
Boutte, C. P.—Shell Petroleum Company—Norco, La.
Bowie, Helen (Mrs. Robert F. Powers)—Kalamazoo, Michigan.
Brainard, G. R.—Shell Petroleum Company—Nome, Texas.
Brimberry, Earl—Standard Oil Company of Louisiana—Baton Rouge, La.
Broussard, Marion U.—c/o Superior Oil Company—Box 608—Lafayette, La.
Brown, B. C.—c/o Shell Petroleum Corporation—Iowa, La.
Brown, Bates—4601 Vanderbilt Drive—College Town—Baton Rouge, La.
Brown, Earl—6632 Avenue T.—Houston, Texas.
Brown, F. P.—Peerless Carbon Black Company—Pampa, Texas.
Brown, J. L.—Shell Petroleum Corporation—Long Beach, California.
Brown, Keevil—Department of Public Accounts—Baton Rouge, La.
Burnette, T. J.—District Geologist Humble Oil Company—Tyler, Texas.
Byrne, George—Tidewater Association Oil Company—2020 McGowen, Houston, Texas.
Carmouche, Leonard—Napeonville, La.
Carter, Frank—Pan-American Oil Company—Dickson, Texas.
Cason, L. D.—The Texas Company—Lafitte, La.
Chambers, Jack—521 Esperson Building—Houston, Texas.
Chappuis, R. D.—Eastman Oil Well Surveying Company—Houston, Texas.
Chawner, William D.—Port Moresby—Papua.
Chison, A. B.—Louisiana Highway Commission—Sicily Island, La.
Clawson, C. H.—United Gas Company—Shreveport, La.

Cobb, Joe—Department of Conservation—Houma, La.

Cockrell, B.—M. G. Kellogg Company—Jersey City, New Jersey.

Colle, Jack—2201 Fannin—Houston, Tex.

Collins, Brock—U. S. National Museum—Washington, D. C.

Conger, T. T.—Standard of New Jersey—Sumatra.

Connell, Allen P.—Civil Engineer—Nashville, Tenn.

Copeland, R.—California Company—Houston, Texas.

Cordill, Stephen—Winnsboro, La.

Crider, G. K.—City Bank Building—Shreveport, La.

Crosby, E. K. Jr.—1732 Madison Street—Lake Charles, La.

Crow, L.—Standard Oil Company—Shreveport, La.

Crowder, Bert—Humble Oil Company.

Cunningham, J. M.—L.S.U.—University, La.

Dacey, R. L.—2055 West Main—Humble Oil Company—Houston, Texas.

Daigle, D. J.—Ellendale, La.

Davidson, Harold—Standard Oil Company of Louisiana—Baton Rouge, La.

DeBlieux, Charles—407 State Street—Baton Rouge, La.

DeBlieux, May—407 State Street—Baton Rouge, La.

de la Houssaye, A. J.—Parkersbury Rig & Reel Company—Houma, La.

de la Houssaye, E. A.—Baton Rouge, La.

de la Houssaye, F. L.—Address unknown.

Denny, Cyril C.—c/o Standard Oil Company of Venezuela—Caripito, Venezuela, South America.

Dohm, C. F.—Standard of Venezuela—Caripito, Venezuela.

Doran, E. B. Jr.—c/o Mr. James Ford—Anthropological Survey—University, La.

Duby, Bryan—c/o Standard of New Jersey—Sumatra.

Dunbar, Clarence—Louisiana Department Conservation—Civil Court Building—New Orleans, La.

Edmondson, R. B.—Lafitte, La.

Elam, Joe—Standard Oil Company of Louisiana—Rodessa, La.

Ellis, A. D.—Stanolind Oil & Gas Company—Houston, Texas.

Ellis, J. F.—Sulphur, La.

Engel, Herman A.—Shell Petroleum Corporation—Kilgore, Texas.

Ervin, Percival—Department Conservation—Houma, La.

Eshete, M. J.—Texas Company—Houma, La.

Esmele, Jasciendo—Chemical Supply Company—New Orleans, La.

Exner, J. B.—Humble Oil Company—Stamford, Texas.

Falcon, F.—Shell Petroleum Corporation—Midland, Texas.

Fava, Frank—Department of Conservation—Lafayette, La.

Fennell, Harvey—Department of Conservation—Buras, La.

Ferguson, Herschel—Consulting Paleontologist—Esperson Building—Houston, Texas.

Fernandez, E. J.—Apartado 86—Puerto Mexico—Ver Cruz, Mexico.

Ferrero, Clarence—Chief Paleontologist—Tidewater Association Oil Company—Houston, Texas.

Fillastre, A. P.—Pollock, La.

Fontenot, M. C.—Shell Petroleum Corporation—Houston, Texas.

Fontenot, W. M.—Basile, La.

Franques, Howard—Superior Oil Company—P. O. Box 423—Jennings, La.

Galley, J. E.—1141 East 35th Place—Tulsa, Oklahoma.

Gandy, Tom S.—Atlantic Pipe Line Company—Aransas Pass, Texas.

Garett, Julius B.—Stanolind Oil & Gas Company—Box 3092—Houston, Texas.

Gay, Andrew H.—Acadian Production Company—New Orleans, La.

Gordy, Matt—P. O. Box 1712—Beaumont, Texas.

Gooch, D. D.—Louisiana Geological Survey—L. S. U.—University, La.

Goode, O. N.—Pan-American Prod. Company—Port Barre, La.

Gorham, Ed.—The Texas Company—Manvel, Texas.

Grady, Dan—Department of Conservation—Baton Rouge, La.

Graham, W. B.—Louisiana Department Conservation—Lake Charles, La.

Grigsby, Garland O.—Geologist—215 Weber Building—Lake Charles, La.

Grigsby, Rhydon B.—Stanolind Oil & Gas Company—Lake Charles, La.

Groves, H. K.—Standard Oil Company of Louisiana—Baton Rouge, La.

Gueymard, A.—Stanolind Oil & Gas Company—High Island, Texas.

Hadley, Wade—Box 1411—Baton Rouge, La.

Hansen, Malcolm—Phillips Petroleum Company—Houston, Texas.

Harp, L. L.—Rio Grande Valley—Probably Reynosa.

Harris, C. M.—Sub-surface department—Shell Petroleum Company—Tulsa, Oklahoma.

Harris, Reginald W.—Professor of Paleontology—University of Oklahoma—Norman, Oklahoma.

Hawkins, Ivy M.—President of Independent Exploration Company—Esperson Building—Houston, Texas.

Hazen, Lee C.—Sarasota, Florida.

Helms, Lee—Address unknown.

Henderson, M.—Land & Lease Department—United Gas Company—Houston, Tex.

Henderson, S. N.—Gulf Oil Corporation—Drawer 2100—Houston, Texas.

Hensley, J. H.—Atlantic Ref. Company—Milam Building—San Antonio, Texas.

Herring, Reybon—Address unknown.

Hopkiemer, A. L.—Eastman Oil Well Survey Company—Houston, Texas.

Hough, Leo—Louisiana Highway Commission—Soils Division—Baton Rouge, La.

House, Glenn—Stanolind Oil & Gas Company—Anhuac, Texas

Houston, S. H.—Field Geologist—Humble Oil Company—Corpus Christi, Texas.

Hoyt, J. L.—Pan-American Prod. Company—Valentine, La.

Huesmann, Herman A.—Stanolind Oil Company—Jennings, La.

Hull, H. R.—c/o Dr. Edgar Hull—New Orleans, La.

Humphrey, Newt,—Minden, La.

Hunt, C. N.—Dist. Engr.—Humble Oil Company—Box 114—Penwell, Texas.

Igau, Herbert C.—Chief Geologist—Bishop Oil Company—1611 National Bank Building—Houston, Texas.

Jackson, Warren J.—P. O. Box 2782—Houston, Texas.

Johnson, F. J.—Union Sulphur Company—Sulphur, La.

Johnson, T. J.—Union Sulphur Company—Sulphur, La.

Jones, N. N.—Petroleum Engineer—Humble Oil Company—Houston, Texas.

Jones, Percy—Field Geologist—Arkansas Gas Company—McAllen, Texas.

Jones, Robert Lee—Cities Service Oil Company—Houston, Texas.

Jones, W. S.—Arkansas National Gas Company—Greggton, Texas.

Journeay, Ben—c/o J. B. Garrett—Houston, Texas.

Kaplan, Harold—205 Third Street—Alexandria, La.

Keever, R. W.—McCollum Exploration Company—Houston, Texas.

Keller, Josephine—c/o Dr. Arthur Keller—University, La.

Kemp, C. C.—Paleontologist—Superior Oil Company—Lafayette, La.

Kemp, H. L.—Shell—Houston, Texas.

Kent, S. P.—The Texas Company—El Campo, Texas.

King, J. K. M.—Mandeville, La.

Kirby, Louie—Geologist for Texas Company in Argentine.

Kirkpatrick, Hobart L.—Production Engineering Department—Arkansas & Louisiana Gas Company—Shreveport, La.

Krause, H. M.—Humble Oil Company—Wink, Texas.

Kyser, John—State Normal College—Natchitoches, La.

LaBranche, M. G.—White Castle, La.

LaCour, Elmo—Box 615 Houma, La.

Lahmann, Ulrich—Address unknown.

Landry, H. P.—Shell Petroleum Corporation—Iowa, La.

Lassiegne, William—Stanolind—Jennings, La.

Latham, J. B.—The Texas Company—Electra, Texas.

Law, John—Humble Oil & Refining Company—Houston, Texas.

Lea, J. W.—Sun Oil Company—Dallas, Texas.

LeBlanc, Francis—Sperry-Sun Well Surveying Company—Houston, Texas.

Legndre, H.—Union Sulphur Company—Welsh, La.

Leisk, Wardell—924 Stephenson Street—Shreveport, La.

Lemoine, J. W.—Personal Finance Company—Shreveport, La.

Lewis, J. Frank—Independent Exploration Company—Houston, Texas.

Lewis, Tom—Pan-Am—Charelton, La.

Lieux, Louis—C.C.C. Camp—Abbeville, La.

McAuliff, J. C.—Columbia Carbon Company—Monroe, La.

McCardell, S. T.—The Texas Company—New Iberia, La.

McCarthy, R. R.—Humble Oil Company—Andrews, Texas.

McCarroll, C.—U. S. Bureau of Mines—Wichita, Kansas.

McCord, C. T.—Lyons & Neeley—Shreveport, La.

McDonald, Stanley—Department of Conservation—New Orleans, La.

McDougall, John—L.S.U.—University, La.

McGuirt, James H.—L.S.U.—University, La.

McMichael, Guy—Texas Company—Lake Charles, La.

McPherson, Dan—Department of Public Accounts—Baton Rouge, La.

McWilliams, John Ford—United Gas Company—Houston, Texas.

Mackey, J.—Union Sulphur Company—Sulphur, La.

Macregor, J. R.—Shell Petroleum Corporation—Hobbs, New Mexico.

Maier, N. D.—Louisiana Highway Commission—Baton Rouge, La.

Martin, Russo—Sun Oil Company—Dallas, Texas.

Mason, Charles C.—Chief Geologist—Standard of Venezuela—Caripito, Venezuela, S. A.

May, George—Union Sulphur Company—Sulphur, La.

May, John Henry—Department of Conservation—Baton Rouge, La.

Mayer, Maurice—Humble Oil Company—Houston, Texas.

Menefee , J. C.—Magnolia Pet. Co.—Magnolia Building—Dallas, Texas.

Merecke, A. B.—Richmond, Virginia.

Merrick, E. J.—Torras, La.

Metzger, H. A.—Department of Conservation—Lake Charles, La.

Miller, Albert D.—10 Levy Building—Lafayette, La.

Mixon, T. M.—Kleinert Avenue—Baton Rouge, La.

Monsour, Eli T.—Consulting Geologist—Room E—Chavenne Bldg.—Lake Charles, La.

Monsour, Emil—Sun Oil Company—Dallas, Texas.

Montgomery, Paul—Department of Conservation—Bunkie, La.

Montz, Ed.—Canal Oil Company—New Iberia, La.

Moresi, Cyril K.—State Geologist for Louisiana—124-128 New Court Building—New Orleans, La.

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Oil and Gas Wells Completed in South Louisiana During 1st Quarter of 1939

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Gravity	Total Depth
BANCROFT (Beauregard Ph.)	Republic Prod. Co.	Columbia L&T Co. #5	1/20/39	246 Bbls.	3/16	38	7,340
	Republic Prod. Co.	Columbia L&T Co. #4	1/26/39	364 Bbls.	3/16	43	7,303
	Republic Prod. Co.	Lutcher & Moore Lbr. Co. #5	2/21/39	403 Bbls.	3/16	45	7,394
	Republic Prod. Co.	Lewis Whitman Est. #1	3/2/39	378 Bbls.	3/16	42	7,371
	Republic Prod. Co.	Lewis Whitman #2	3/28/39	300 Bbls.	3/16	43	7,322
BAY ST. ELAINE (Terrebonne Ph.)	The Texas Co.	State-Bay St. Elaine #B-2	2/25/39	357 Bbls.	1/8	25	6,972
BIRD ISLAND (Plaquemines Ph.)	Gulf Refg. Co.	Grand Prairie Levee Dist. A-3	2/4/39	456 Bbls.	5/16	31	7,141
CAILLOU ISLAND (Terrebonne Ph.)	The Texas Co.	State-Caillou Island #54	3/13/39	421 Bbls.	1/4	31	4,283
CHALKLEY (Cameron Ph.)	Humble Oil & Refg. Co.	Cameron Ph. School Board #1	2/20/39	745 Bbls.	1/4	38	9,101
CHARENTON (St. Mary Ph.)	St. Mary Oil Co.	H. Robichaux #2	1/4/39	140 Bbls.	Open	21	1,132
	St. Mary Oil Co.	P. Robicheaux #3	1/9/39	8 Bbls.	Open	20	1,142
	St. Mary Oil Co.	Robicheaux #4	1/24/39	41 Bbls.	Open	20	1,139
	Edmont Oil Co.	W. C. Hertel B-1	1/23/39	49 Bbls.	Open	20	1,136
	St. Mary Oil Co.	W. E. Hertel et al #2	1/6/39	264 Bbls.	Open	21	1,127
	St. Mary Oil Co.	Hertel et al #3	1/13/39	215 Bbls.	Open	20	1,130
	St. Mary Oil Co.	Hertel #4	1/27/39	314 Bbls.	Open	20	1,129
	St. Mary Oil Co.	LeBlanc #1	1/26/39	198 Bbls.	Open	20	1,138
	Pan American Prod. Co.	A. Veeder Co. Inc. #11	1/1/39	64 Bbls.	1/4	21	1,661
	St. Mary Oil Co.	Rene Blanchard #3	2/28/39	132 Bbls.	Open	21	1,130
	St. Mary Oil Co.	W. E. Hertel et al #1	2/23/39	49 Bbls.	Open	20	1,862
	Knisely Oils Inc.	W. E. Hertel et al #3	2/14/39	107 Bbls.	Open	21	1,133
	St. Mary Oil Co.	Hertel #6	2/18/39	124 Bbls.	Open	21	1,131
	St. Mary Oil Co.	Paul LeBlanc #3	2/9/39	314 Bbls.	Open	21	1,133
	St. Mary Oil Co.	Paul LeBlanc	2/16/39	82 Bbls.	Open	21	1,130
	St. Mary Oil Co.	Robicheaux #5	2/1/39	8 Bbls.	Open	21	1,135
	Pan American Prod. Co.	Robichaux #6	3/8/39	372 Bbls.	1/4	24	2,623
	J. P. Scranton	Bayou Grue #1	3/22/39	600 Bbls.	1/4	35	7,898
	Pan American Prod. Co.	A. Veeder Co. Inc. #12	3/28/39	354 Bbls.	1/4	24	2,626
CHOCTAW (Iberville Ph.)	Louisiana Crusader Oil Co.	E. B. Schwing #6	3/9/39	362 Bbls.	1/4	....	8,240
CREOLE (Cameron Ph.)	The Superior Oil Co.	Gulf of Mexico-State #4	1/18/39	403 Bbls.	12/64	33	5,153
	Superior Oil & Pure Oil Co.	Gulf of Mexico-State #5	3/15/39	72 Bbls.	8/64	49	6,855
DARROW (Ascension Ph.)	Humble Oil & Refg. Co.	Val E. Landry #4	1/4/39	678 Bbls.	1/4	39	7,045
DOG LAKE (Terrebonne Ph.)	The Texas Co.	State-Dog Lake #22	3/1/39	16 Bbls.	3/16	....	7,014
EAST HACKBERRY (Cameron Ph.)	The Union Sulphur Co.	Caldwell #7	1/9/39	948 Bbls.	1/4	29	7,208
	The Union Sulphur Co.	Doiron #11	2/8/39	816 Bbls.	3/16	30	7,203
	The Union Sulphur Co.	Watkins #45	3/19/39	75 Bbls.	?	27	3,082
EOLA (Avoyelles Ph.)	S. W. Richardson	Haas Inv. Co. #1	1/16/39	779 Bbls.	1/4	43	8,581
	S. W. Richardson	Haas Inv. Co. #2	3/21/39	762 Bbls.	1/4	43	8,660
	S. W. Richardson	Haas Inc. Co. #3	3/20/39	762 Bbls.	1/4	43	8,576
EVANGELINE (Acadia Ph.)	O'Meara Bros.	McFarlain #2	12/27/38	516 Bbls.	14/64	39	6,710
	Jolly Petroleum Co.	McFarlain-Crusel #2	1/4/39	516 Bbls.	14/64	40	6,867
	Shell Petroleum Corp.	Conover Community #5	1/7/39	450 Bbls.	14/64	35	7,741
	Glassell & Glassell	Gus Trushel #7	1/17/39	541 Bbls.	14/64	38	7,625
	Jolly Petroleum Co.	Lawrence McFarlain #3	1/16/39	534 Bbls.	14/64	39	7,254
	Superior Oil Co.	Wm. Leckelt #16	2/19/39	311 Bbls.	12/64	36	8,229
	Shell Pet. Corp.	E. Prather #1	3/5/39	776 Bbls.	1/4	38	7,392
	Glassell & Glassell	McFarlain #5	3/10/39	498 Bbls.	14/64	39	7,268
	Glassell & Glassell	R. McFarlain #6	3/4/39	482 Bbls.	14/64	40	7,527
GARDEN ISLAND BAY (Plaquemines Ph.)	The Texas Co.	State-Garden Island Bay #31	3/3/39	129 Bbls.	3/16	30	6,915
HARANG (Lafourche Ph.)	John Vaccaro	Acosta #1	1/1/39	264 Bbls.	1/4	31	5,402
	Pan American Prod. Co.	Community A-2	2/5/39	240 Bbls.	8/64	?	9,322
HORSESHOE BAYOU (St. Mary Ph.)	The Texas Co.	St. Horseshoe Bayou #2	3/20/39	31 Bbls.	10/64	48	12,770
LAFITTE (Jefferson Ph.)	The Texas Co.	Madison Realty Co. #4	1/3/39	1,264 Bbls.	3/8	35	10,134
	The Texas Co.	LLECO-Lafitte #2	1/11/39	1,284 Bbls.	3/8	36	10,070
LAKE HERMITAGE (Plaquemines)	Gulf Refg. Co.	Lafourche Basin Levee Dist. #9	2/8/39	130 Bbls.	1/4	31	3,166
LAKE LONG (Lafourche Ph.)	Fohs Oil Co.	State-Long #7	2/15/39	48 Bbls. & 9 MCF	9/64	42	9,819
LAKE PELTO (Terrebonne Ph.)	The Texas Co.	State-Lake Pelto #22	2/4/39	71 Bbls.	1/8	?	5,328
LAKE VARRET (West) (St. Martin Ph.)	Shell Pet. Corp.	Jeanerette L&S Co. #2	2/5/39	275 Bbls.	1/4	34	8,057
LIRETTE (Terrebonne Ph.)	Humble Oil & Refg. Co.	La Terre Co. Inc. #1	1/9/39	24 Bbls.	1/4	?	?

MCF—Million Cubic Feet of Gas—the open flow capacity of a gas or distillate well.

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Grav-ity	Total Depth
NEW IBERIA (Iberia Ph.)	Canal Oil Cc. Inc.,	Sabatier #5	2/7/39	169 Bbls.	3/16	20	2,504
	William Helis	Bullock #8	3/23/39	300 Bbls.	3/16	32	5,846
NORTH CROWLEY (Acadia Ph.)	Humble Oil & Refg. Co.	H. Jos. Habetz #3	1/20/39	798 Bbls.	1/4	35	8,240
NORTH TEPETATE (Acadia Ph.)	Atlantic Refg. Co.	G&R Klumpp #3	1/25/39	129 Bbls.	1/4	56	8,700
	Atlantic Refg. Co.	Alcide Fournerat #1	2/21/39	44 Bbls. & 3 MCF	3/16	53	8,547
PORT BARRE (St. Landry Ph.)	Pan American Prod. Co.	J. C. Cormier #5	2/7/39	769 Bbls.	1/4	33	4,845
POTASH (Plaquemines Ph.)	Humble Oil & Refg. Co.	Orleans Levee Bd. #37	1/23/39	700 Bbls.	1/4	28	8,070
QUARANTINE BAY (Plaquemines Ph.)	Gulf Refg. Co.	Orleans Levee Dist. #A-2	2/13/39	680 Bbls.	1/4	36	8,187
SOUTH ROANOKE (Jeff. Davis Ph.)	The Union Sulphur Co.	T. R. S. Farm #2	1/21/39	160 Bbls.	15/64	52	10,124
SWEET LAKE (Cameron Ph.)	Pure Oil Co.	Yount Lee Oil Co. #14	1/30/39	195 Bbls.	10/64	35	7,151
UNIVERSITY (East Baton Rouge, Ph.)	William Helis	Nelson #3	2/4/39	412 Bbls.	12/64	35	6,476
	William Helis	Nelson #1	3/3/39	249 Bbls.	16/64	35	7,479
	William Helis	Duplantier #5	3/16/39	178 Bbls.	12/64	35	6,460
VENICE (Plaquemines Ph.)	Tide Water Assoc. Oil Co.	Manhattan L&F Co. #9	2/8/39	242 Bbls.	5/32	41	5,770
VILLE PLATTE (Evangeline Ph.)	Continental Oil Co.	Martha Haas #2	1/7/39	357 Bbls.	3/16	39	9,089
	Continental Oil Co.	Mrs. N. H. Hirsch #2	1/8/39	348 Bbls.	3/16	40	9,077
	The Texas Co.	E. B. Norman Fee #2	1/12/39	224 Bbls.	10/64	41	8,988
	Continental Oil Co.	Oscar Pitre #2	1/13/39	372 Bbls.	3/16	39	9,050
	Continental Oil Co.	Fontenot-Ludeau #1	2/12/39	378 Bbls.	3/16	40	9,048
	Continental Oil Co.	Mrs. Ed. Tate #2	2/13/39	360 Bbls.	3/16	38	9,085
	Continental Oil Co.	P. McDaniel #3	1/17/39	202 Bbls.	3/16	55	8,970
	Continental Oil Co.	Fontenot-Deshotels #1	2/27/39	259 Bbls.	3/16	39	9,095
	Continental Oil Co.	J. E. Vidrine #2	2/28/39	360 Bbls.	3/16	49	9,136
	Continental Oil Co.	Vidrine-Deville #3	3/19/39	384 Bbls.	3/16	40	9,053
	Continental Oil Co.	Orise-Deville #1	3/26/39	279 Bbls.	17/64	59	9,115
WEST CHARENTON (St. Mary Ph.)	St. Mary Oil Co.	Hertel #5	3/5/39	115 Bbls.	Open	20	1,128
WEST HACKBERRY (Cameron Ph.)	Superior Oil Co.	Benson Vincent #5	2/3/39	275 Bbls.	9/64	40	7,810
WOODLAWN (Jeff. Davis Ph.)	Union Sulphur Co.	Calcasieu Nat'l Bank #4	3/24/39	128 Bbls.	14/64	44	8,875

Oil and Gas Wells Completed in North Louisiana During 1st Quarter of 1939

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Grav-ity	Total Depth
COTTON VALLEY (Webster Ph.)	Hunt Oil Co.	Hope #23	1/1/39	394 Bbls.	1/4	49	5,940
	The Ohio Oil Co.	B. Sidney Heirs #8	1/4/39	526 Bbls.	5/8	73	8,636
	North American Oil Consld.	Stewart #4	1/16/39	612 Bbls. & 7 MCF	1/2	71	8,724
	Hunt Oil Co.	Sandifur #	1/31/39	240 Bbls.	1/4	71	8,7[illegible]0
	Oliphant Oil Corp.	Gray-Stephens #1	1/31/39	728 Bbls.	1/4	46	8,600
	Woodley Petroleum Co.	J. O. Couch #1	2/3/39	414 Bbls.	3/16	41	8,597
	Hunt Oil Co.	Webb #5	2/12/39	411 Bbls.	1/4	49	5,961
	Oliphant Oil Corp.	A. J. Hodges A-1	2/28/39	919 Bbls.	16/64	46	8,690
	Roy L. Fisher	S. P. Coyle #1	3/3/39	165 Bbls. & 2½ MCF	11/32	?	6,000
	Ohio Oil Co.	S. S. Merritt #1	3/6/39	317 Bbls.	1/4	5	5,913
	Stanolind O & G Co.-Delaney Oil Co.	Coffee-Pardee #1	3/8/39	1,504 Bbls.	?	42	8,627
	Hunt Oil Co.-Stanolind O & G Co.	Webb Inv. Co.-Coffee #1	3/9/39	449 Bbls.	1/2	62	8,470
	Hunt Oil Co.	Webb #6	3/20/39	394 Bbls.	1/4	?	5,943
LITTLE CREEK (La. Salle Ph.)	R. E. Bevis	A. T. Dean #2	3/25/39	56 Bbls.	?	19	1,635
MONROE (Ouachita, Union and Morehouse Phs.)	Interstate Nat'l Gas Co.	Fee Min. #91	1/26/39	715 Bbls. & 21½ MCF	......	....	2,159
	Interstate Nat'l Gas Co.	Minn Fee #90	1/30/39	725 Bbls. & 20 MCF	......	....	2,177
	Carbons Consolidated Co.	Brown Haile #1	2/7/39	930 Bbls. & ½ MCF	......	....	2,219
	Southern Carbon Co.	Richland #6	2/25/39	480 Bbls. & 2½ MCF	......	....	2,214
	Interstate Nat'l Gas Co.	Spencer #9	3/3/39	910 Bbls. & 1 MCF	......	....	2,164
	United Carbon Co.	N. R. Nolan #2	3/21/39	995 Bbls. & 2½ MCF	......	....	2,176
RODESSA (Caddo Ph.)	F. W. Burford	H. Clay Brown #3	3/23/39	42 Bbls.	1	42	6,125

MCF—Million Cubic Feet of Gas—the open flow capacity of a gas or distillate well.

Oil and Gas Wells Completed in North Louisiana During 1st Quarter of 1939

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Grav-ity	Total Depth
SHONGALOO (Webster Ph.)	Magnolia Petroleum Co.	H. M. Branton #4	2/20/39	92 Bbls. & 1¼ MCF	7/32	62	9,202
SHREVEPORT (Caddo Ph.)	W. C. Feazel	T. R. Hughes #1	1/12/39	462 Bbls.	12/64	44	5,590
	Hurricane Petroleum Co.	W. B. Chandler #1	1/14/39	528 Bbls.	1/2	?	5,676
	Hurricane Petroleum Co.	W. H. North #1	2/5/39	192 Bbls.	3/4	55	5,591
	R. O. Kniveton	Kohn North #1	2/6/39	768 Bbls.	1/4	?	5,562
	Harry Hanbury	S. G. Sample #1	2/17/39	594 Bbls.	1/4	46	5,568
	R. L. Bauman	Emile Dorian #1	2/26/39	264 Bbls.	1/2	46	5,599
	W. C. Leisk	T. G. Sinclair #1	3/10/39	636 Bbls.	64/64	44	5,558
	Hurricane Petroleum Co.	Chandler C-1	3/15/39	379 Bbls.	1/8	45	5,624
	Harry Fotiades	S. A. Tomlinson #1	3/16/39	792 Bbls.	1/2	44	5,592
	Harry Hanbury	Slack #1	3/29/39	712 Bbls.	32/64	44	5,561
	Leon Dunn	Raymond Nelson #1	3/31/39	396 Bbls.	32/64	44	5,562
	W. C. Feazel	Hunter Co. #1	3/31/39	198 Bbls.	24/64	44	5,560
TULLIS-URANIA (Grant Ph.)	D. E. Grandstaff	J. G. Irwin #1	3/17/39	40 Bbls.	......	21	1,533
VIVIAN (Caddo Ph.)	L. H. Mahon	Henderson #1	2/3/29	602 Bbls.	23/64	45	2,476
ZWOLLE (Sabine Ph.)	Major Oil Co.	Bowman-Hicks Lbr. Co. #5	12/29/38	4 Bbls.	......	38	2,685
	Major Oil Co.	Bowman-Hicks Lbr. Co. #6	12/29/38	3 Bbls.	......	39	2,504
	Clyde Creighton	Bowman-Hicks Lbr. Co. #1	2/3/39	104 Bbls.	......	41	2,618
	W. L. Posey	J. W. Hale #3	2/18/39	123 Bbls.	......	41	2,517

MCF—Million Cubic Feet of Gas—the open flow capacity of a gas or distillate well.

The School of Geology

[Continued from Page 55]

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◆

BULLETIN ON COOK MOUNTAIN FORAMINIFERA PUBLISHED

Geological Bulletin No. 14, entitled "Louisiana Cook Mountain Eocene Foraminifera," by Dr. H. V. Howe was available for distribution during the early part of April. The report containing 122 pages with 14 plates of drawings of microfossils, supplies information concerning 170 species and varieties of Claiborne Foraminifera from 169 Louisiana samples. Of these, 160 samples are from the Cook Mountain formation; two are thought to be from the Sparta formation. So little has been published concerning the Claiborne Foraminifera of the Gulf Coast that a surprisingly large number of the species are necessarily described as new. The comparatively recent discoveries of oil from the Cockfield formation at Cheneyville and Bancroft and from the Sparta at Ville Platte have attracted attention to the possibilities of Claiborne production in central Louisiana. It is felt that this report, describing the Foraminifera from the beds lying between these two producing formations, will be an aid to the oil industry in unravelling the petroleum stratigraphy of that portion of the State.

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SUGAR AND OIL!

Here we see the oil derrick rising from a field of sugar cane, one of those vivid contrasts characteristic of the changing landscape of South Louisiana.

One having its origin thousands, hundreds of thousands of years ago, when the River deposited a thick column of rock containing numerous horizons of "black gold"; the other having its origin in the rich alluvial silt deposited by the River in comparatively recent time, as measured by geological periods.

That of the later origin is a comparatively old Louisiana industry, dating back to the 18th century; the other is a new industry in southeast Louisiana, a lusty infant still in its swaddling clothes.

At one time both sugar and oil were considered luxuries that only the wealthy could afford, but they are now necessities in our national economy, reflecting the advanced standards of American living.

Science has rendered a service of inestimable value in the development of both these industries, but science has barely scratched the surface of Louisiana's natural resources and their by-products.

DEPARTMENT OF CONSERVATION
STATE OF LOUISIANA
NEW ORLEANS

Science Tames The Wildcat!

The rain-maker is still in the news—but the divining rod of the oil prospector is a relic of the past.

Louisiana and the American Petroleum Institute have this in common, that they are the chief beneficiaries of scientific research and its astounding achievements.

There would be no deeper drilling in Louisiana if our pioneer geologists and geophysists and paleontologists had gone to sleep, like Rip van Winkle, for the past twenty years. And the costs of deeper drilling would have been prohibitive if science had not improved its methods of exploration to increase the percentage of its successful tests and reduce the percentage of dry holes.

But just as the telephone, the automobile, the motion picture and the radio have been improved and perfected there is a challenge to the scientific mind, in laboratory and field, to improve our instruments and methods of exploration, drilling and production.

Here in Louisiana there will be staged the next advance in the conquest of science. The expanding activities and increased production of the oil industry will keep pace with this advance and our peak of production will represent a real test and triumph of man's intelligence, enterprise and perservance in the face of tremendous odds.

We therefore invite the members of the American Petroleum Institute to turn their eyes in this direction and join with us in this great development.

DEPARTMENT OF CONSERVATION
STATE OF LOUISIANA
WILLIAM G. RANKIN, Commissioner